The Farm

QUARTERLY, SPRING 1957, FIFTY CENTS

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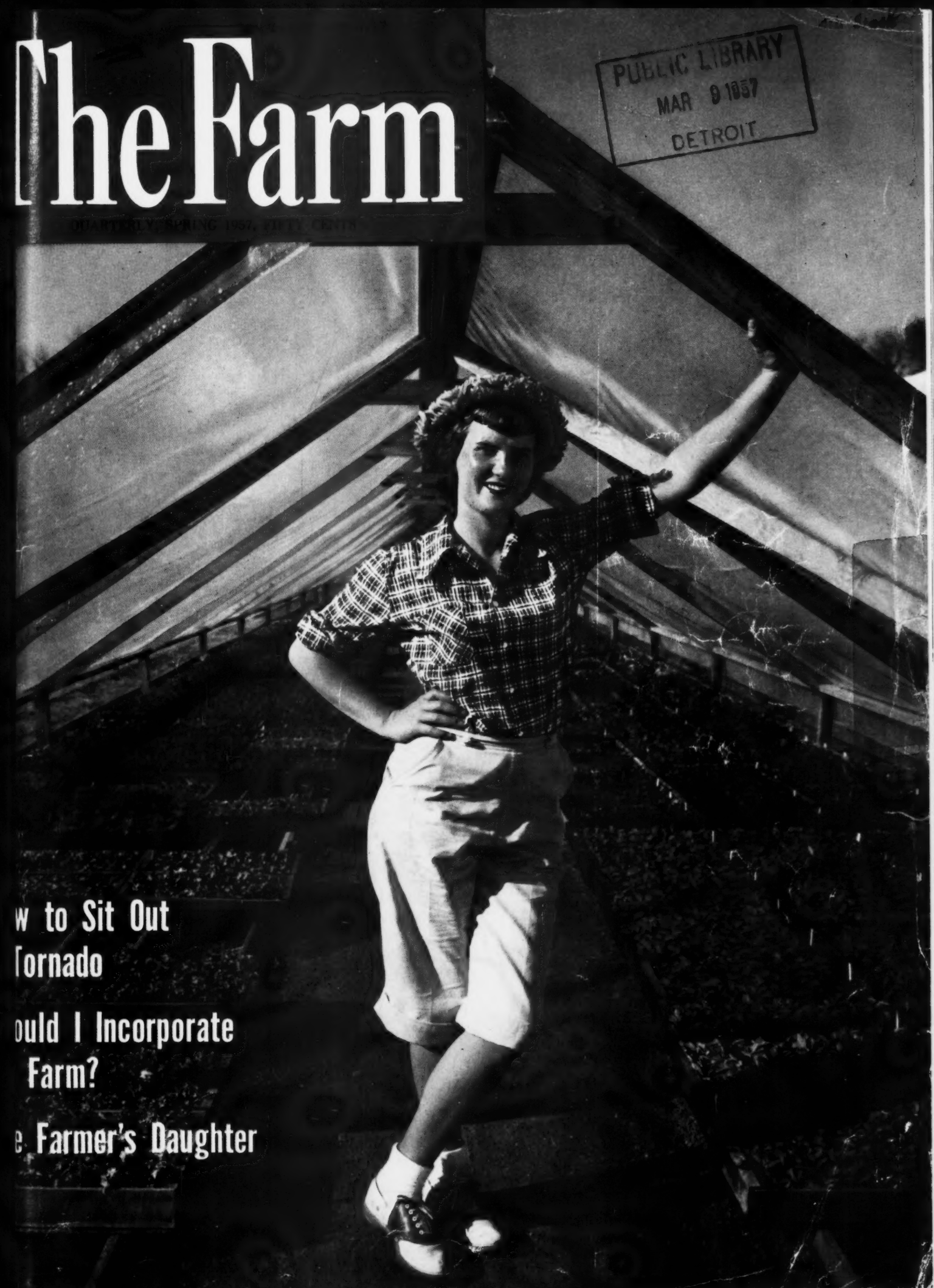
DETROIT



w to Sit Out
Tornado

ould I Incorporate
Farm?

e Farmer's Daughter

U. 12 - 1957/58

Why winter's meanest jobs are licked by Wedge-*in* action

See why Super-Sure-Grip does more work faster, lowers tire costs—

LONGER, RULER-STRAIGHT LUGS increase traction area. They come *closer together at shoulders* (A), apply a *"Wedge-In"* grip on all types of footing, deliver most powerful PULL!

O-P-E-N C-E-N-T-E-R is self-cleaning – helps lugs bite deeper.

GREATER AIR-VOLUME for better ground contact, easier ride, greater load capacity.

LONG, EVEN WEAR – longer *ruler-straight* lugs work evenly, roll smoothly – and so wear slowly and evenly!

STRONGER BODY defends against bruise-breaks – adds long, trouble-free tire life. Goodyear, Farm Tire Dept., Akron 16, Ohio.

Frozen woodpile—frozen, snowy footing—and a lift that tries to upend you and start wheels spinning. When a tractor tire can handle all that, it can handle *anything!*

Super-Sure-Grip handles it like any other farm job – with Goodyear's exclusive *"Wedge-In"* action.

Ruler-straight lugs (for surest p-u-l-l) are longer (for strongest p-u-l-l) and ANGLE-ENGINEERED to hold bad footing in a *vise-like* squeeze —and then kick clods out for the next clean bite!

Sounds simple – but nobody has matched it for work-saving, time-saving, fuel-saving and *wear-saving.* That's why survey after survey shows –

MORE FARMERS PREFER GOODYEAR TRACTOR TIRES THAN ALL OTHER MAKES *PUT TOGETHER!*

Look for this nearby Goodyear dealer sign for better tire values—better tire care. Convenient credit terms.

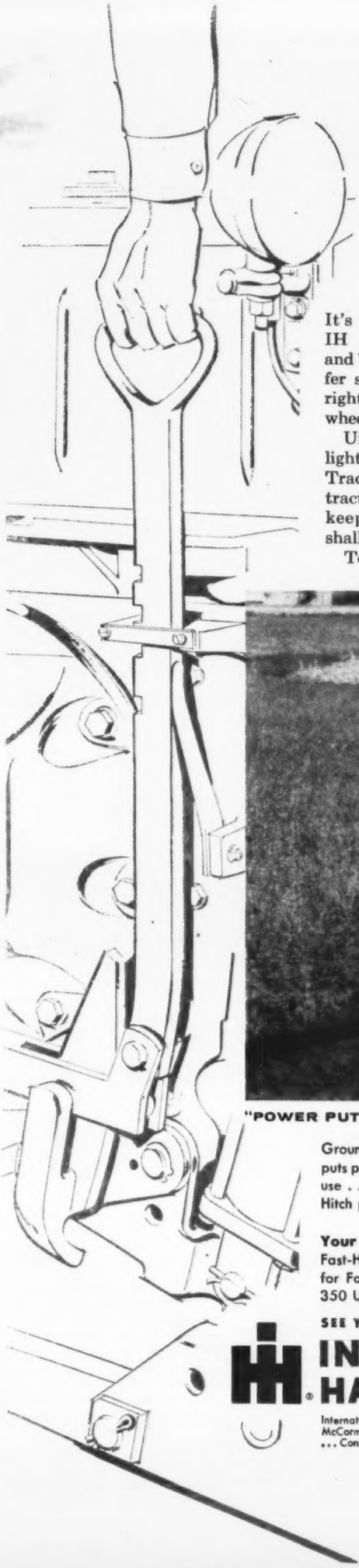
Super-Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

Super-Sure-Grip Tractor Tires

See "THE GOODYEAR PLAYHOUSE"—TV—Sunday 9-10 E. S. T.

MAR 11 '57



now

TRACTION GROWS WITH THE LOAD!

New Fast-Hitch with Traction-Control and "Pilot Guide" give you round-gaining ground grip . . . look-ahead farming!

It's new . . . different . . . unequalled—IH Fast-Hitch with Traction-Control and "Pilot Guide"! This IH weight transfer system continuously keeps just the right amount of pressure on tractor drive wheels to beat slippage.

Unlike other devices that abruptly lighten the load to match traction, IH Traction-Control Fast-Hitch gives you traction that *grows with the load!* You keep plowing full-depth when others shallow out.

To add up to a ton of "wheel weight," just pull a handy lever! Several lever settings match weight transfer to *any* field condition. "Pilot Guide" shows proper range of weight transfer and plowing depth.

Unlike hydraulic traction devices which rob engine power when needed most, the mechanical action of Traction-Control Fast-Hitch keeps every horsepower harnessed to the load. New Fast-Hitch retains Back . . . Click! . . . and Go! hitching—gives full control of cultivator with *one* hydraulic cylinder.

"POWER PUT TO BETTER USE!"

Ground-gripping traction that grows with the load puts power of new Farmall® 450 (above) to better use . . . pulling new McCormick® 4-furrow Fast-Hitch plow in hard, root-bound sod.

Your IH dealer will gladly demonstrate new IH Fast-Hitch with Traction-Control and "Pilot Guide" for Farmalls 230, 350, 450, and International® 350 Utility tractors. Call him, TODAY!

New "Pilot Guide" for IH Traction-Control Fast-Hitch. Just glance at this handy device to check plowing depth, and determine whether you have the right amount of weight transfer.

Send coupon TODAY!

SEE YOUR INTERNATIONAL HARVESTER DEALER

International Harvester products pay for themselves in use—McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois

International Harvester Company
P. O. Box 7333, Dept. FQ-3, Chicago 80, Ill.

Tell me how new IH Fast-Hitch with Traction-Control can put power to better use on my farm. Send information on:

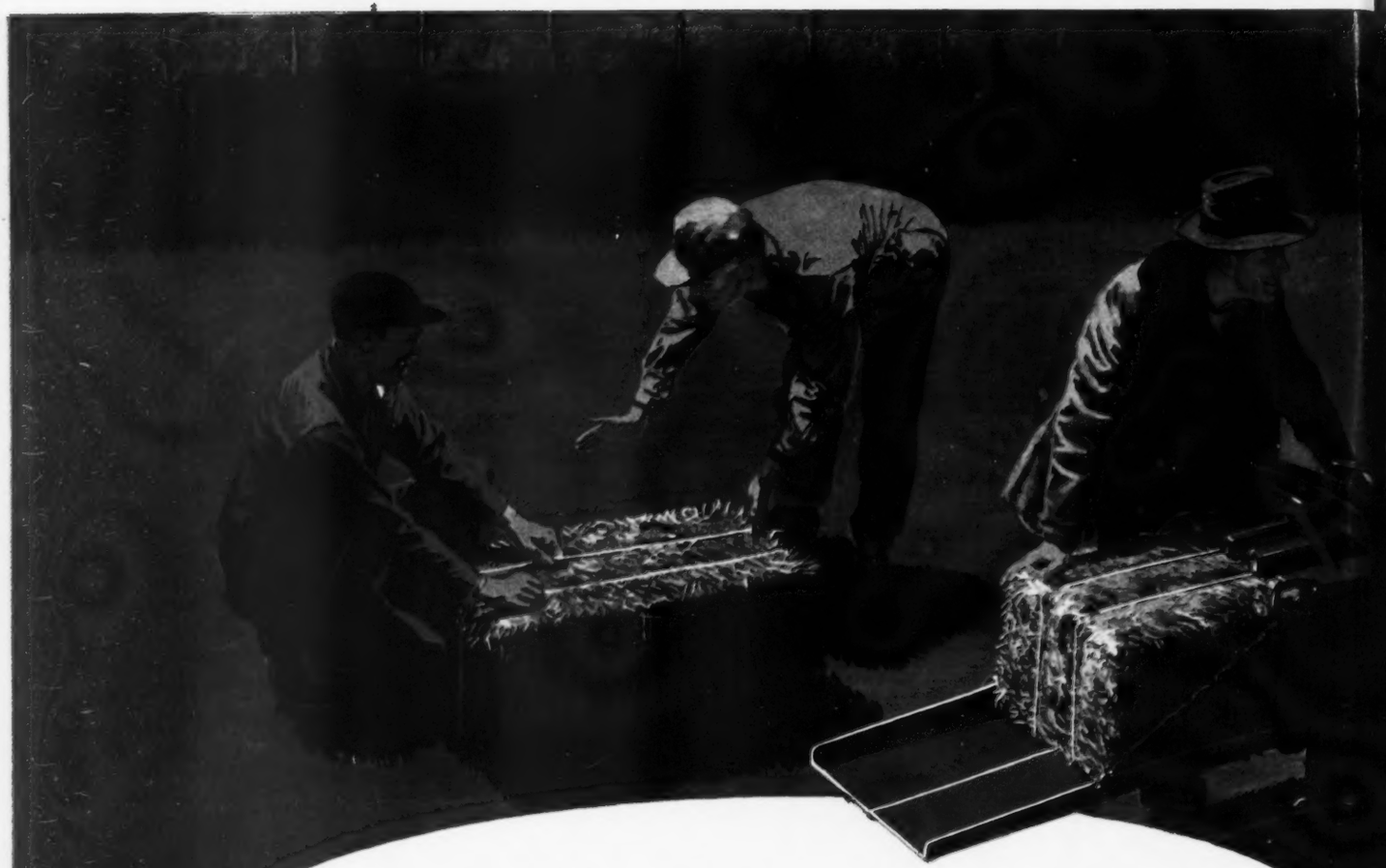
☐ Farmall 450 (4-5 plow) ☐ Farmall 350 (3-plow) ☐ Farmall 230 (2-plow)
☐ International 350 Utility (3-plow)

Name_____

Address_____

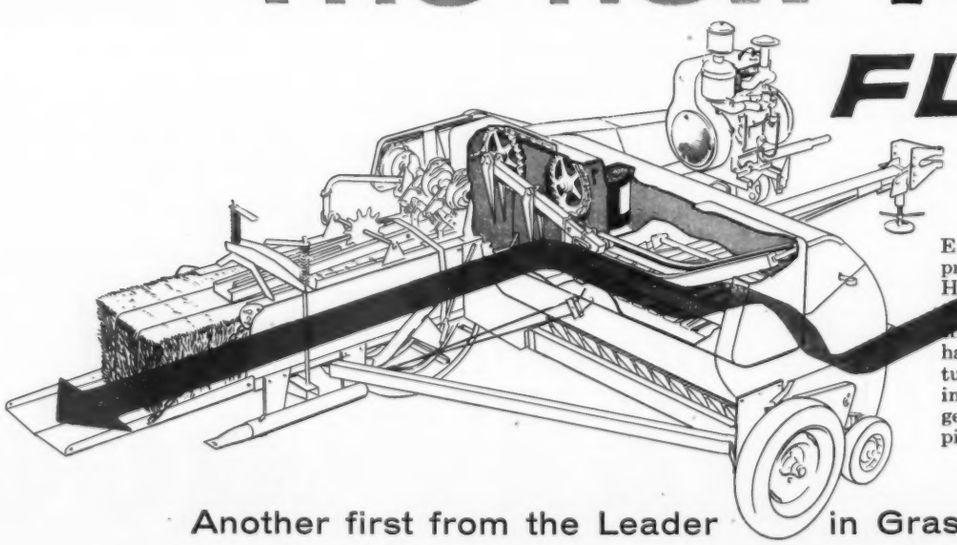
Post Office_____ State_____

My IH dealer is_____



Announcing the greatest advance in balers in seventeen years!

The new HAY FLOW



This is FLOW-ACTION!

Exclusive new operating principle developed by New Holland and found only on the new HAYLINER 68. It's the best friend a leaf ever had! No sharp corners to turn, no twisting and turning, no wadding—just a gentle, flowing action from pickup to bale chamber.

Another first from the Leader in Grassland Farming

Engine-powered (above) or P.T.O., the new HAYLINER 68 gives you big-baler capacity at small-baler price.

YLINER 68 with
/-ACTION!

Have you seen the new way to bale hay? Never before has there been anything like it—the New Holland HAYLINER 68!

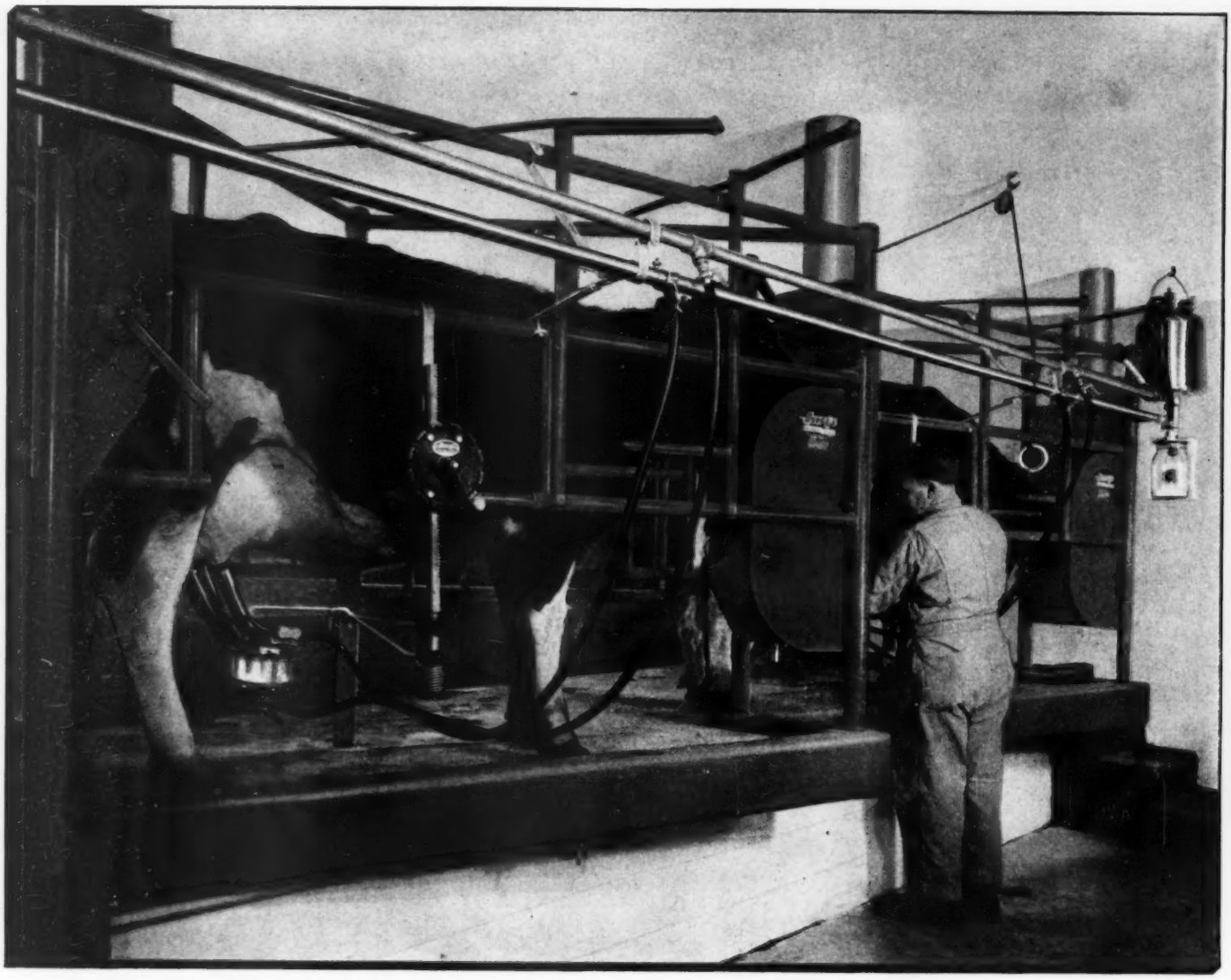
Completely new from hitch to chute, the HAYLINER 68 gives you big-baler capacity with the low price and handling ease of much smaller balers. How's it done? The secret's in FLOW-ACTION. It's an entirely new way of moving hay from field to finished bale. It hardly disturbs a leaf. No auger. No wadboard. Just a smooth, gentle flowing action.

The HAYLINER 68 handles your hay less because it has fewer moving parts. It puts the most feed value into every bale.

And look at the way the bale is built—square, cleanly sliced. Easy to stack. Easy to feed out.

You don't have to wait until summer to see FLOW-ACTION in action. Your dealer can demonstrate it *right now* in his showroom or on his lot. Hurry down today! New Holland Machine Co. Division of Sperry Rand Corp., New Holland, Pa.

NEW HOLLAND



Happy Hired Help does a Better Job of Cow Milking

A clean, safe and comfortable Surge Siphon parlor attracts those cow-milking men who take pride in their work.

And . . . In a Surge Siphon parlor you have Genuine Surge TUG & PULL cow milking at its very best because your good man can so easily see exactly what each quarter of each cow is doing.

That's why a Surge Parlor is such a splendid investment for the man who plans to add some more cows and stay in the cow-milking business.

ALL Surge Equipment is sold on EASY TERMS... a modest down payment and up to 24 months to pay the balance.

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BABSON BROS. CO.
2843 W. 19th St. • Chicago 23, Ill.

SURGE

ATLANTA • HOUSTON • KANSAS CITY • MINNEAPOLIS • SACRAMENTO
SEATTLE • SYRACUSE • TORONTO

One of NEW IDEA's new torture tests to find ways to provide maximum stamina in the new No. 400 rake. Strain gage recording equipment mounted in truck accompanies rake. 250 round trips over this track subject the rake structure to the stresses and strains encountered in about 2500 acres of heavy raking.

Look at the NEW IDEA New Pull-Type Parallel Bar Rake before you buy

Makes finest hay—fluffy windrows—minimum leaf shattering —cleanest raking—tested on torture track and on farms

To help you make better quality hay, the NEW IDEA engineering department has designed a truly advanced new 8-foot pull-type parallel bar rake that fits all tractors.

Quality hay in half the time. This brand new, 5-bar, pull-type, parallel bar rake handles hay gently, makes uniform, fluffy windrows. Basket tilts to vary fluffiness of windrow. Can cut raking time in half. Makes unbroken windrows on corners so that balers and forage harvesters can operate with uninterrupted feed.

Positive ground drive, with constant ratio between reel speed and forward travel, gives minimum leaf shattering plus unusually clean raking.

Many advanced features. Exclusive rubber bushings at each end of stabilizer provide quieter operation and reduce wear. Widefooted, screw type jack folds out of way, gives ample clearance for hay. Because of buffer springs, basket rides easily over rough ground.

New convenience. Exclusive single crank (standard equipment), operated from tractor seat, controls transport lift and operating height. Basket is levelled by a simple adjustment; a crank attachment, driver operated, is available as an extra. Sealed, grease filled gear box needs lubrication once a year. Clutch is operated from tractor seat.

Torture proved, farm proved. This new rake has been proved and improved on the NEW IDEA torture track, to provide longest life. And it has been on-farm tested to prove that it gives finest performance in producing quality hay.

Get all the facts on this advanced new pull-type parallel bar rake from NEW IDEA. Ask your dealer, where it will soon be on display; or write for new literature.

Look at New Idea before you buy

NEW IDEA FARM EQUIPMENT COMPANY, DIVISION AVCO DISTRIBUTING CORP.

Dept. 2073, Coldwater, Ohio

Please send free literature checked:

- ☐ Pull type parallel bar rake
- ☐ Mounted parallel bar rake
- ☐ Pull type rakes and tedders
- ☐ Booklet "Tried and New Ideas for Making Hay"

Name_____

Address_____

Town_____ State_____

Farm Quarterly, Vol. Twelve, No One. Editorial, Circulation and Executive Offices, 22 East 12th Street, Cincinnati, Ohio. Published quarterly by F. & W. Publishing Corp. Subscription price 50c a copy; $2.00 for one year; $3.50 for two years; $5.00 for three years. Add $1.00 per year extra for rates outside the United States and Canada. Entered as second-class matter at the Post Office, Cincinnati, Ohio, under the Act of March 3, 1879. (Title Reg. U.S. Pat. Off.)

MOST POWERFUL
Row-Crop Tractor
on the Market!

The powerful new "720" Tractor with the full-size, fully integral 4-bottom plow.

The *New* JOHN DEERE "720"

Official Nebraska Tests prove it!

Just recently, three John Deere "720's*—a gasoline, an LP-Gas, and a Diesel model—broke the horsepower record for row-crop tractors . . . *and the Diesel set a new fuel economy record!*

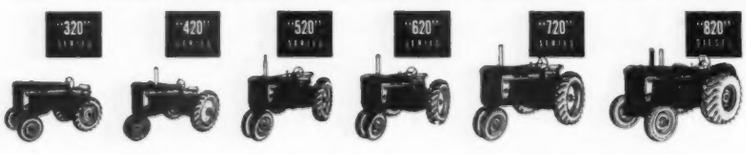
When it comes to work capacity, no other tractor can produce like a John Deere "720." Here is *row-crop* power that will replace *two* tractors on many farms at plowing-disking time and cut labor costs to the bone . . . here is general-purpose utility that will handle *every* power job the year around . . . here is fuel and maintenance economy that will slash operating costs to new lows . . . all in a tractor with every modern feature to make your work far easier, much more enjoyable.

Your John Deere dealer is eager to tell you all about the exciting new "720" and demonstrate it on your farm. See him soon and learn all about this new Power, Performance, and Value Leader of the row-crop tractor field.

**Each model developed more than 58 b.h.p. (Sea level, calculated; based on 60°F. and 29.92 in. Hg.)*

See the new John Deere Tractor Family at your John Deere dealer's. There are power sizes and types for every need, and each is entirely new in looks . . . performance . . . and value!

6 Power Sizes... 30 Basic Models



The New "520" and "620" Series

If you do not require "720" power, see and drive a new 3-plow "520" or 4-plow "620" Tractor. Like the "720," these tractors offer you new *Custom* Powr-Trol for effortless hydraulic control of equipment (above), Advanced Power Steering, Independent PTO, Float-Ride Seat, and many other fine features. Gasoline or LP-Gas engines.

JOHN DEERE

SEND FOR FREE LITERATURE

JOHN DEERE • MOLINE, ILL. • DEPT. T-54

Please send me further information on the new John Deere Tractors checked below:

☐ "520" SERIES ☐ "620" SERIES ☐ "720" SERIES

Name_____ ☐ Student

R.R._____ Box_____

Town_____

State_____

CHECK THESE FEATURES!
Balance . . . Proportion . . . Design • PROTOLLOY Steels • Good Obstruction Clearance • Tough, Non-Slip Finish • Plainly Marked Openings.

PROTO Flat Wrenches are truly "professional quality" tools, made of specially forged alloy steel, carefully heat treated. Designs are based on scientific study to make them as slim as possible for convenience in tight places, yet reinforced properly where it counts to eliminate breakage. See your nearby PROTO dealer today. Send 10¢ for catalog of entire line to

PROTO TOOLS
2217 Santa Fe Ave., Los Angeles 54, Calif.
Eastern Factory, Jamestown, N.Y.
Canadian Factory, London, Ont.

A. NEW! Whitworth Combination Box & Open End Wrenches. Four sizes commonly used on foreign automobiles and motorcycles. Whitworth openings, 3/16" to 3/8". Lengths, 5 1/4" to 8 1/4". Satin chrome plated.

B. NEW! Long 6-Point Box & Open End Wrenches. Provide greater gripping area for heavier torque loads. 5/16" to 3/4" openings. 5 3/4" to 9 1/8" lengths. Satin chrome plated.

C. NEW! Ratcheting 12-Point Box Wrench. For oil filter work on new cars. 5/8" x 3/4" openings. 8 1/16" long. PROTO line now includes 6 tools in this series.

D. NEW! Double Head 12-Point 15° Box Wrench. Meets Mil. Spec. Designed for use on elastic stop nuts. Openings, 7/16" x 17/32". Length, 5 1/4". Satin chrome plated.

A5666

PROTO TOOLS
PROTO means PROfessional TOols

The Farm QUARTERLY

Spring, 1957, Volume 12, No. 1

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THE FARM QUARTERLY
22 East Twelfth Street, Cincinnati 10, Ohio

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Summer issue on sale June 6 at all Class A newsstands.

COAST TO COAST

THE BIG SWING IS TO REGISTERED HOLSTEINS

Sign of the Times

The consistently profitable production level of REGISTERED HOLSTEINS under practical conditions is shown by a recent report of DHIA testing in a leading mid-western dairy state.

Six of the ten top herds in butterfat production and all ten high herds in milk production were REGISTERED HOLSTEIN herds!

Even more impressive is the fact that of 2,929 cows producing 500 lbs. of butterfat or more, 1,371 were REGISTERED HOLSTEINS and 822 others were daughters of REGISTERED HOLSTEIN sires!

Ninety-four of 142 sires with daughters exceeding the production of their dams were REGISTERED HOLSTEINS!

East or West, North or South, the big swing is to big forage cows . . . rugged, deep-bodied, REGISTERED HOLSTEINS.

Practical cows for practical dairying, REGISTERED HOLSTEINS have the size and capacity to handle big tonnages of pasture, silage and hay . . . the inherent ability to convert grass to milk at top efficiency.

In every section of the country, more-milk-per-cow with REGISTERED HOLSTEINS is proving the real answer to increased dairy profits under today's conditions.

HOLSTEIN-FRIESIAN ASSOCIATION OF AMERICA

BRATTLEBORO, VERMONT

Registered HOLSTEINS *Breed of the Times*

Better than Ever!

Wayne Chick Starter

with new 3 way P:AA:C total nutrition balance

P:AA:C proteins amino acids calories

Good news for Chick raisers! Better than ever WAYNE CHICK STARTER contains new 3-way P:AA:C total nutrition balance developed by Wayne Research Scientists. It balances proteins, amino acids and calories for greater feed utilization. It takes only 3 lbs. of WAYNE CHICK STARTER per chick to assure a safe, strong start. More than 25 powerful, carefully tested ingredients in a high energy ration give maximum nutrition the first critical weeks.

★ *First aid for ailing chicks— Wayne H-A-D Krums and Wayne Stress Diet.*

Wayne Grower Feeds

Wayne Grower is a high energy ration especially fortified to build healthy, vigorous pullets. Only 7 lbs. of Wayne plus 10 lbs. of your own grain builds a "Profit Pullet."

Wayne Starter & Grower is the choice of many chick raisers who like the convenience of an excellent combination feed for starting and growing pullets at low feeding cost.

WHERE GRAINS ARE PLENTIFUL

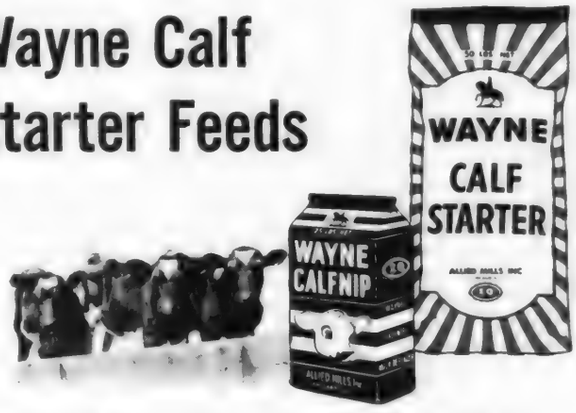
If you live in a heavy grain area, ask us how you can make full use of your own grains blended with better than ever Wayne Concentrates for starting and growing chicks.

Wayne Tail Curler Pig Feeds

Here's a pig starting program developed at the Wayne Research Farm designed to meet the needs of both pigs... and pig raisers! No matter if you pre-start baby pigs for early weaning...or follow a regular weaning program...there's a Wayne Tail Curler Pig Feed that will help you get your pigs off to a record breaking start, and deliver real profits at market time. Ask us for details on complete Wayne Hog Programs for Starting, Growing and Finishing.

★ *First aid for ailing pigs—Wayne Res-Q Diet for protection against costly scours due to bacterial infections.*

Wayne Calf Starter Feeds



Better than ever results are yours with this Wayne two-feed team...Wayne Calfnip Milk Replacer and the new FORMula Wayne Calf Starter. Research Farm tests on this new starter showed gains averaged 10.6% on 14% less feed per pound gain compared to present style calf starters! Calves like the coarse, uniform texture...keeps calves eating without growth lag after weaning. New Wayne Calf Starter's antibiotic fortification helps reduce incidence of scours.

Your friendly Wayne Feed Dealer

Send for the latest Feeding Developments for Pigs, Chicks, and Calves

ALLIED MILLS, INC. Executive Offices: Chicago 4, Ill. Service Offices: Fort Wayne 1, Ind.

Builders of Tomorrow's feeds Today!

T-1559

Get the full value from high-priced land, seed, fertilizer and water.

Try Soil Engineering with CAT* Equipment...

Soils and crops men often find the missing link between fertilizer, water and high yields is *soil engineering!* They've pretty definitely shown that your ground may be loaded with nutrients and water, but if your soil isn't right, your corn yields won't get up much above 80 bushels, nor cotton yields over a bale per acre. Your limiting factors may be drainage, soil texture, topography, profile, depth of topsoil, character of subsoil and many other soil problems.

It is frequently possible to correct these problems *mechanically*—this is the function of soil engineering. For example, it may include every phase of land development from clearing off patches of trees or filling in gullies that cut up your fields, to blending different types of soil to mechanically produce just the right seedbed for your crops and climate.

Obviously, these jobs call for greater power, efficiency and economy than wheel-type farm tractors can muster.

But getting the most from your soil, seed, fertilizer and water is within your practical reach. There's a Cat Diesel Tractor and matched equipment to exactly suit your farming plans. You can go into full time or spare time land development on your farm. You can bulldoze and scrape off the crowns of the hills, fill in the low spots. Subsoil to facilitate drainage and deepen your crop root feeding zone. Build drainage and irrigation ditches—and erase them, too, at will. Clear off pesky hedgerows. Eliminate irregular shaped fields.

Just as important, with an all-purpose Cat Diesel Farm Tractor, you can handle all these jobs—and then switch immediately to general farm work. Once again, the extra power, traction, economy and long life of a Cat Diesel Tractor pay off in terms of more work accomplished, more money for you.

Your Caterpillar Dealer will gladly help you select the right tractor for your farm. Name the date—he'll demonstrate!

CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

Cat D4 Tractor has 50 DBHP. Pushes or pulls 10,700 lb. —⅓ again as much as most 50 DBHP wheel-type tractors. Burns low cost fuels. Handles 5 to 6 bottoms.

Cat No. 12 Motor Grader has 115 HP. Every practical ditching and blade leveling position can be easily, accurately and positively made from operator's seat.

SEND COUPON FOR FREE LAND FORMING BOOKLET

Caterpillar Tractor Co., Peoria, Ill., Dept. FQ37

☐ Send me "Soil and Water Conservation."

I farm_____acres. Am interested in a_____tractor.

☐ Check here if student.

Name_____

Address_____Telephone_____

City_____State_____

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

TRACTORS • TOOL BARS
TOOLS • ENGINES
EARTHMOVING EQUIPMENT

One of our herd bulls—Wotan 435
Age 3 years Weight 2650 pounds

PURE-BRED CHAROLAISE BEEF CATTLE

WEIGHT-FOR-AGE — Our aim is simple and direct. We breed to produce enormous beef animals which attain very heavy weights at an early age.

The Charolaise standards of conformation are different than those of the English and Scotch breeds. We produce breeding animals, whose conformation guarantees very heavy weights at an early age.

Times and needs have changed and the enormous weight-for-age ratio of the pure-bred Charolaise marks these animals as the ancestors of the beef herds to come.

The cattle breeder who starts a herd of pure-bred Charolaise now will be in a strategic position. He will own cattle that very few other breeders own; he will own cattle that thousands of other breeders want and he can change his operation from an expensive, losing hobby to a profitable, sound business.

Good breeding stock, outstanding animals of enormous weight-for-age are at a premium. The demand is fantastic because the need is real.

If you start a breeding herd of pure-bred cattle now, you will enjoy the financial benefits that accrue to cattle breeders who can produce animals to fit a pressing economic need which is continually expanding.

We can supply you with a few choice head to start you on the right path.

Write for descriptive booklet.

TURKEY RIDGE FARM

Member of the American Charolaise Breeders Association
Member of the American Charbray Breeders Association

JAMES CLANCY, Manager **MORRIS COHON, Owner**

NEAR—PORTLAND, PA.

P.O. Box R.F.D. No. 1 **Bangor, Pa.**

Telephones: Twin Oaks 7-6545 and 7-6184

PIONEER Hybrids
Help bring Better Living to Farm Families

PIONEER Hybrids are Constantly Dependable . . . Consistently Productive. Year after year . . . PIONEER has the ability to "wring out" every possible bushel of sound quality corn . . . under all sorts of weather . . . in all types of soil.

Plant PIONEER — the Hybrid of PROVED Bigger Yields and Greater PROFITS . . . the Hybrid that will bring better living to your family. See your local PIONEER Salesman TODAY!

PIONEER Hybrid Seed Corn is produced by the following companies:

Garst & Thomas Hybrid Corn Co. — Coon Rapids, Iowa

Pioneer Hi-Bred Corn Co. — Des Moines, Iowa

Pioneer Hi-Bred Corn Co. of Illinois; Princeton, Ill.

Pioneer Corn Co., Inc. — Tipton, Indiana

It Pays to Do Your Own Soil Testing

by H. J. Atkinson, director
Sudbury Laboratory

Too many farmers do not yet realize there is an easy way to make up to three times as much profit on the bushels or tons they produce. You can cut the acreage you plant to conform to soil bank requirements or for other purposes, yet wind up the year with a higher net income than any other season in the past ten years.

That's how the family farm can continue to be the backbone of agriculture — both now and in coming years when increased population will require every bushel you can raise from every acre you own.

So much has been learned about the soil and its care by research scientists, professors, agronomists and extension workers in agricultural colleges and experiment stations that they have revolutionized the business of farming. They have made it possible to double the average yield per acre.

All that is needed is to be open-minded enough to take advantage of their discoveries, and get far more from your farm than 100% of parity would bring.

It takes almost all you get for the first 40 bushels of corn per acre just to pay your costs — then your profits begin to climb! Raising average yield up to 70 bushels by using the proper kinds and amounts of fertilizer, impossible without soil testing, will boost profits from $14.80 to $42.00 per acre (if sold at $1.40 per bu.). What applies to corn is equally true with other farm crops.

Get Results Quickly

Hundreds of thousands test their own soil with the Sudbury Soil Test Kit. Some use their kit in addition to state laboratory tests where they can get them; others rely on it completely and do a more thorough job than to send a few samples off by mail.

The demand for soil testing has grown so fast some laboratories must take several weeks before reports can be supplied. One of the country's leading soil authorities has said the soil testing that should be done in this generation cannot be done unless more farmers do their own.

No one can afford unnecessary losses when a Sudbury Soil Test Kit costs only $29.95. It tells what is wrong even before you plant, and how to correct it. All summer long it keeps watch to let you know if more fertilizer is needed; next fall it tells how much this year's crops used up, and how much you need for next year.

If you don't test your soil now, it may cost you hundreds of dollars this year.

Make More Money

How to Make Your Farm Pay You More in 1957

These are days when every dollar counts! You can't afford to buy fertilizer and not be sure it's what your crops need. You can't afford to do without it either! Don't gamble—make sure every dollar you spend pays back up to $10 or more in extra yield. ***That's your sure way to make more money this year!***

Besides getting bigger crops with a Sudbury Soil Test Kit, you'll save money on fertilizer—up to $15 an acre.

Do It Yourself with this

Farmers Lifetime Soil Test Kit

Complete with everything for hundreds of tests. More valuable than all your stock and tools! Shows right amounts of nitrogen, phosphate and potash for each field. Also whether lime is needed (pH) and how much. County agents, ag colleges, vo-ag schools and progressive farmers everywhere depend on it. Lifetime welded steel chest with carrying handle. Easy instructions show needs of 225 different crops.

Don't wait for poor crops to show your soil is sick. Your Soil Test Kit tells what is wrong even before you plant, and how to correct it.

If you've already bought your 1957 fertilizer, a Soil Test Kit shows how best to apply it. If you haven't ordered, it tells you what you need.

Big Value, only $29.95.

You can take your kit right out into the field and test as you go. No one else knows your farm as well as you—you know the poor spots in every field. That's where you'll want to test first, then the good acres alongside. You'll be amazed how different their needs are.

Experts now agree that soil testing and proper fertilizing is more important than adding extra acreage. Regardless of what crops you're growing, it's the yield per acre that counts... not the number of acres you work!

Every Acre You Plant Can Give Extra Yield

Sudbury users all over the country report increases in both yield and quality—like the Ohio farmer who doubled his wheat crop, tripled corn and hay, boosted oats 500%. Wouldn't you like to grow up to 200 bu. corn per acre—or 700 bu. potatoes, 60 bu. wheat, 100 bu. oats, 5 tons hay, 30 tons tomatoes, 300% increase in milk?

You not only make money, you save money. An Illinois farmer "guessed" he needed 235 tons of limestone, but tests showed he did not and saved him $500 which paid for phosphate really needed on 65 acres. That wrong guess would have cost him more than a dozen Soil Test Kits!

Get every dollar's worth of value out of the fertilizer you buy this winter, as well as next spring and summer. You'll use your kit all season long.

The right fertilizer prevents stunted ears, weak roots and lodged stalks. Corn ear and stalk at right were grown in tested soil, fertilized correctly.

Soil Can Make, or Break You!

Sudbury Soil Test Kits make poor farms rich, even biggest farms more profitable. Soil testing is the best insurance against drought losses. Use of soil test kits is approved by U.S. Dept. of Agriculture.

In just 2 weeks your Soil Test Kit will pay for itself many times over!

No Knowledge of Chemistry Needed

Easy as Reading a Thermometer

So simple anyone can use it. Even your first tests will be accurate and reliable. Ready to use anytime, anywhere, even out in the field. Takes only 10 minutes, costs less than 10c a test. No delays waiting for reports ***—you get the correct answer right away.***

FREE TRIAL and also Better Crops GUARANTEE

You Take No Risk—use it for 10 days free trial; if not delighted return for refund. Sudbury's daring **Better Crops Guarantee** says we are so certain you'll get bigger crops we'll refund the full price of your kit next fall if you don't.

Over 500,000 Now In Use

SUDBURY Soil Test Kits

FREE BOOK If you send cash we'll also include the valuable 64-page book on farm management, "Our Land and Its Care."

CUT OUT AND MAIL TODAY!

3 ways to pay

FREE TRIAL Order Blank

SUDBURY LABORATORY Box 77F, Sudbury, Mass.

Send me the Sudbury Lifetime Soil Test Kit for free trial on your Money-Back Offer and Better Crops Guarantee. I am using the payment plan checked below:

- ☐ Enclosed is check or money order for $29.95. It is understood you will send prepaid, saving me $1.91 to $3.55 in delivery charges. **I am also to receive FREE the valuable book on farm management, "Our Land and Its Care."**
- ☐ Send my Soil Test Kit C.O.D. I'll pay $29.95 and delivery charges on arrival.
- ☐ **Easy-Payment Plan.** I'll pay mailman $4.95 plus delivery charges, then send you 4 monthly payments of $6.75 each.

Name .....

R.D. or St. .....

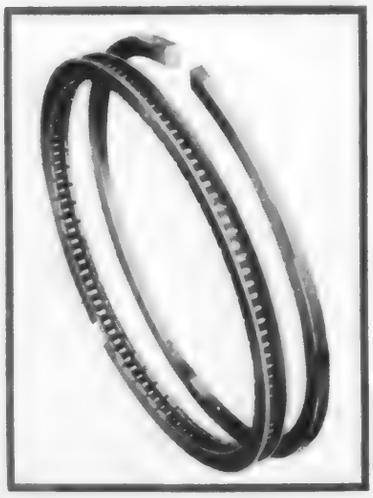
P.O. ..... *Zone* ..... *State* .....

Sudbury is the World's Largest Makers of Soil Test Kits

SUDBURY LABORATORY
Box 77F, Sudbury, Mass.

full power here

for twice as long!



On modern mechanized farms, it takes a heap of power to keep plows, disc harrows, cultivators and other vital equipment operating at top efficiency. Full-powered farm engines are a "must". And one sure way to assure maximum power and economy is to install Perfect Circle 2-in-1 Chrome piston rings in your farm engines right now!

Perfect Circles stand up better under rigorous farm service because both the top rings and the oil rings are plated with thick, wear-resisting solid chrome. The life of cylinders, pistons and rings is more than doubled. You get more field time between overhauls. For sustained power with lasting oil economy, insist on PC 2-in-1 Chrome piston rings for your car, truck and tractor. Perfect Circle Corporation, Hagerstown, Indiana; The Perfect Circle Co., Ltd., Don Mills, Ontario.

Perfect Circle

2-in-1 Chrome piston rings

The standard of comparison

Can You Top This?

Sirs:

In reading your Winter magazine I saw the item "There Ain't No Such Animal." This describes a steer which is said to be the largest in the world.

I thought I would write to let you know that I own a steer which is larger than that one. My steer weighed 3330 pounds at the Plymouth Fair in August of last year. He girts 9 feet and 3 inches.

He has pulled in many of the pulling contests in Maine, New Hampshire, and Massachusetts. He and his mate have won many blue ribbons. He is very quiet and gentle.

I am enclosing a picture taken in October. He is a purebred Holstein; was 10 in September but acts like a young steer. We call him Bill.

Someone should have him who has the time to exhibit him at the fairs and exhibitions as he creates a great interest wherever he has been shown. I would be interested in knowing if there are any that are larger than this one.

Frank J. Scruton

Scruton's Dairy,
R.F.D. 2,
Rochester, New Hampshire.

Or Rebel Republican

Sirs:

I notice on page 26 of your Autumn issue there is someone in your organization who is belittling the soil bank program. This sounds like a disgruntled Democrat. President Eisenhower needs the support of all the farmers, the farm writers, and not knocks.

Let's keep your fine paper non-partisan and all work together for better farm prices.

H. W. Williams

New Lexington, Ohio

Wrong State

Sirs:

On page 54 of your Autumn issue you have a full-page picture in color of some Shetland ponies in a corral and you say that the picture was taken in western Kansas.

I thought you would be interested in knowing that it was taken on our ranch in western Montana. It was taken by a commercial photographer, Ernst Peterson, but how this mistake was made we do not know.

We enjoyed the article on ponies very much and were glad to find a picture of our place in the magazine.

George B. Vinson

Big Arm, Montana

We humbly beg reader Vinson's pardon.

(*Continued on page* 157)

Wonderful way to paint !

Makes old wood look new,
Brightens metal things, too . . .
Flows on smooth—sets up *hard*—really covers!
Use it outdoors *or* in,
Grab your brush and begin . . . with
That wonderful paint by
LOWE BROTHERS!

PLAX—easy-to-put-on enamel that smoothes itself as it dries to a tough, weather-resisting finish. No brush marks! Wide choice of colors for inside and outside.

PLAX-COTE—puts a scuff-resistant surface on porches, patios and all floors—indoors and out. Flows on easily and smoothly with brush or roller. Dries quickly. Lasts and lasts.

PLAX WATER-CLEAR—for a crystal clear finish that beautifies and protects *all* wood and painted surfaces. So durable it's ideal for marine paint jobs ✓ ✓ ✓ Your friendly Lowe Brothers dealer can recommend a professional painter. THE LOWE BROTHERS COMPANY, Dayton 2, Ohio.

LOWE BROTHERS

Factories . . .
DAYTON
OAKLAND
TORONTO

MAKERS OF Super Kem-Tone® . . . KEM-GLO® AND LOWE BROTHERS' **PAINTS** FOR HOME & INDUSTRY

Three Great
DEKALB PRODUCTS
for the Betterment of American Agriculture
The good earth is America's greatest blessing . . . a tremendous source of wealth and security. Through research, DeKalb has contributed greatly to stimulating America's vast agricultural productivity with three Key products . . . DeKalb Seed Corn—a leader in sales and results for 17 years . . . DeKalb Chix . . . and NOW—DeKalb Hybrid Sorghum . . . latest product of DeKalb Research. All three great DeKalb Products offer better farm production . . . better farm living . . . an improved, stronger and more profitable agriculture.
Commercial Producers & Distributors of DeKalb Seed Corn, DeKalb Chix, and DeKalb Hybrid Sorghum.
DEKALB Hybrid SORGHUM
DEKALB CHIX
DEKALB Seed CORN
DEKALB
A Great Name in Agriculture

Which tractor stays at the barn?

One thing's for sure. When you own a Ferguson, it won't be the tractor you leave behind.

It'll be your favorite . . . on light jobs or heavy. On either, there's no better tractor for easy handling and low operating costs. Because the Ferguson is recognized as the one tractor with a completely integrated hydraulic system. No tedious, separate adjustments. You get full use of all your power—automatically.

When you're plowing, for instance: You can plow with 3 bottoms in most soils . . . at a cost the bigger, fuel-wasting tractors can't match. And you get this power and economy on job after job.

Farmers generally sum it all up in one sentence by saying: "It's got the Ferguson System."

It's the System that gives you complete control. You can raise or lower implements . . . hold them in any position . . . maintain effective draft control . . . even change the speed of response.

That's how the Ferguson saves your job time and cuts operating costs. That's why we think you'll pick it for just about every tractor job on your farm. Why not see your Ferguson dealer? Talk performance. Talk trade. See him first . . . or last. Either way you can't lose. *Ferguson, Racine, Wisconsin.*

Ferguson

POWERED TO SAVE
YOUR JOB TIME

the story of how

8 Men Built 1 Barn in 2 Days

USING POLE-TYPE CONSTRUCTION AND KOPPERS PRESSURE-CREOSOTED POLES

MR. FLOYD CALHOUN
Columbus, Shenango County, N.Y.

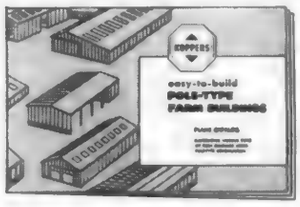
When Mr. Calhoun needed a new machinery shed he chose pole-type construction using Koppers pressure-creosoted poles. A pole-type building could be quickly built without foundation, would cost 50 per cent less than a conventional building, needed no highly skilled craftsmen, and would be long lasting and practically maintenance free.

1st Day—AM: With a 7:00 AM start, all pole holes were dug and the Koppers pressure-creosoted poles positioned, and braced before 10:30. By noon, end rafters and outside plates were in place.

1st Day—PM: Inside plates, scab boards and truss rafters were nailed to the posts during the afternoon. By milking time the basic structure was completed, ready for roofing and siding.

2nd Day—AM: Two, four man crews put up the roofing and siding. By lunch time most of the roof was on and the four sides were just about up.

2nd Day—PM: Siding and roofing completed, sliding doors were framed and hung. At nightfall, Mr. Calhoun drove his tractor into 1 of the 5 bays.



WRITE FOR COMPLETE CATALOG OF POLE-TYPE BUILDING PLANS

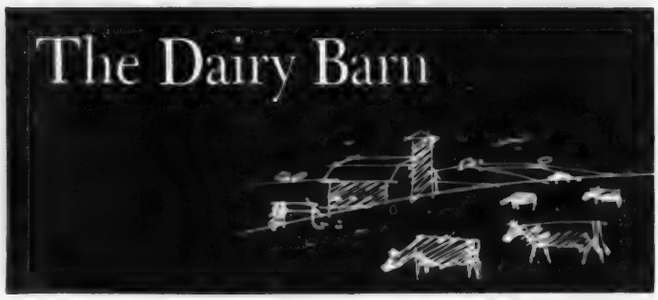
It outlines the advantages of pole-type construction and details with pictures and floor plans the many easy-to-build plans available.

Write: Koppers Company, Inc., Wood Preserving Div., 1465 Koppers Bldg., Pittsburgh 19, Pa.

P-6

KOPPERS

KOPPERS POLES



Calves on Pasture The thing that makes writing a column like this interesting is that you never know where you are going to turn up your material. Like this item. We were sitting there looking at a piece of blank paper with no idea what to put on it when we got a call from Marshall McCullough. Mac was out at the station; he was passing through town on his way to Pittsburgh and just called up to say Hello.

Like the rest of us Mac is frequently short on money, but unlike editors, writers and such people, he's never short on ideas. He has inspired more than one item in these pages and since he carries the impressive title of Dairy Nutritionist at the Georgia Agricultural Experiment Station his completely unexpected call was the perfect answer to this columnist's prayer.

"What's new?" we asked after an exchange of pleasantries.

"Why don't you tell the folks about the way we're raising calves on pasture?" he asked. And that's not a bad idea at all. In fact, it's such a good idea it probably demands a full-scale article, but in the meantime here are some of the highlights.

McCullough is a hard-shelled grass addict. He thinks a dairy cow was made to eat grass and roughage and feeding her much of anything else doesn't make sense. One point of his theory is that to get high producers that will do well on such a ration you have to start them young. So he has been fooling around with calves, starting them out on pasture when they are only a week old, and doggone if the idea isn't paying off. The first calves they started raising this way are now in the Station's dairy herd, are outstanding in their superior body development and are first-class milk producers.

The most important point in the program is that calves must have good to excellent pasture. They won't do well on poor pasture. But give them the right kind of grass and they will come right along. For example, a bunch of calves that were put on excellent oats and ryegrass pasture from November through March, which is their best pasture season down there, made an average gain of 1.10 pounds per day. At the end of 12 weeks they weighed an average of 167 pounds compared with a birth weight of 74 pounds. They received no grain and consumed an average of 300 pounds of whole milk.

In contrast to this, on poor pasture during a dry summer, calves which received an average of 273 pounds of milk plus a supplemental feeding of up to 4 pounds of grain per head per day gained an average of only .65 pounds per day. They weighed 65 pounds at birth and tipped the scales at only 120 pounds at 12 weeks.

The calves on excellent pasture did as well, or better, than a barn-fed check group.

McCullough warns that for the first few months the pasture-fed calves will be pretty rough looking. By the time they are yearlings though, "they make mighty fine looking heifers."

During the first four years of this experiment there have been no death losses among the calves, scouring has never been a problem and there has been a very low incident of internal parasitism, the latter condition probably due to rotating pastures every ten days or so.

How Much? The costs of milk production is a lot like the weather—it changes while you're talking about it, usually on the upside. That's why a lot of folks figure it is just a waste of time to try to pin-point the cost of producing a bushel

(*Continued on page* 154

"OFFICIAL WORLD'S RECORD* FAT PRODUCER HAS ALWAYS BEEN MILKED WITH A DE LAVAL MILKER,"

writes: R. B. McLAUGHLIN, owner of Haven Hill Crescent Gewina Count.

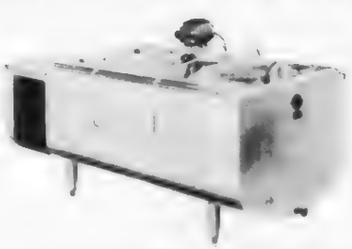
*1523.0-lbs. FAT 38,878-lbs. of 3.9% MILK

"Our record-breaking cow, Haven Hill Crescent Gewina Count, has always been milked with a De Laval Milker (Magnetic). We never have mechanical trouble with our units, nor has there been any udder damage.

Probably the best testimonial I can give for the De Laval is that the udder of this great cow has retained the same shape, and is as soft and pliable as when she was a two year old. Moreover the entire mammary system was officially classified "Excellent" last February. During her life she has probably been milked by from 25 to 30 men, who with all their individual traits, made no apparent difference since the actual work was done by the De Laval unit."

DE LAVAL
SEPARATOR COMPANY

R. B. McLAUGHLIN also writes: "RECENTLY WE INSTALLED A DE LAVAL COMBINE MILKER® ALONG WITH A DE LAVAL BULK COOLER, WHICH WE BELIEVE WILL HELP US CONTINUE TO PRODUCE HIGH QUALITY MILK WITH GREATER SAVINGS THROUGH LESS TIME AND LABOR REQUIRED."



THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 201 E. Millbrae Ave., Millbrae, Calif.

Bites deep
and pulls out clean!

FIRESTONE CHAMPION GROUND GRIP

a longer lasting tire that gets more work out of your tractor

You hear a lot said about the importance of tread design on tractor tires, and it *is* important. The best rubber, the strongest tire body in the world won't help you unless it has a properly designed working tread—like Firestone Champion Ground Grips, for instance.

The traction bars are tapered and curved from the center for easier dig-in at the middle, for positive grip as the pressure moves out to the sides. But there's no wiping at the tapered center of the bar. It's prevented by a big double-thick tread base.

And they *do* pull out clean . . . flared tread openings, designed by Firestone after years of practical farming experience on the Firestone Farms at Columbiana, Ohio, make sure of it. Firestone Champions take full advantage of both rotational and flexing action to get positive cleaning.

See the Firestone Champion tractor tire at your nearby Firestone Dealer or Store. He'll be glad to quote you the low cost of exchanging tires on your tractor.

Your Firestone Farm Service Specialist . . . right at your front door with money-saving advice and maintenance service—Hydro-Flation for your tractor tires, free inflation and inspection of all your tires. Call him at your Firestone Dealer or Store.

Firestone

Enjoy the voice of Firestone on radio and television every Monday evening over ABC

Copyright 1957, The Firestone Tire & Rubber Co.

Prevention or Treatment—

WITH ONE SHOT!

Prevention of disease is always a primary aim of successful animal management, particularly during periods of stress or adverse weather conditions.

That's why it's significant that so many experienced dairymen, cattlemen and other livestock owners rely on INJECTION BICILLIN. They know the long-lasting, effective blood levels of INJECTION BICILLIN achieve prevention, *without* time-consuming, costly, frequent dosage schedules.

They also know that, where the press of market schedules or other activities makes an adequate prevention program impossible, they can rely on INJECTION BICILLIN FORTIFIED for powerful, fast-acting *treatment.*

Wyeth

Philadelphia 1, Pa.

For One-Shot Prevention—

INJECTION

BICILLIN®

(Benzathine Penicillin G)

Prolonged blood levels, lasting *5-7* days, from a single shot!

For One-Shot Treatment—

INJECTION

BICILLIN® FORTIFIED

(Benzathine Penicillin G and Procaine Penicillin G)

High, *immediate* penicillin blood levels to fight infection; *prolonged* levels to reduce possibility of relapse!

Protect your profits with Wyeth products!

AVAILABLE FROM YOUR ANIMAL HEALTH PRODUCTS SUPPLIER

the ability to outyield ***doesn't***

just

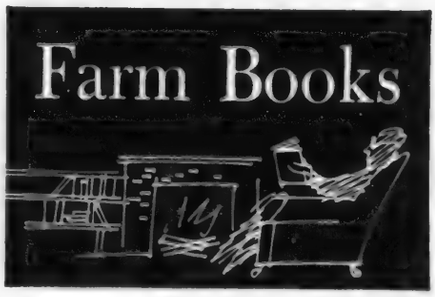
happen

Genuine Pfister Hybrids
OUTYIELDED other hybrids
8 out of 10 times
in 12,417
COMPETITIVE YIELD CHECKS
made right in farmers'
fields by an average of
9.8 more bushels
of #2 shelled corn
per acre . . .

extra yield . . .
extra profits

Genuine PFISTER HYBRIDS

PFISTER ASSOCIATED GROWERS, INC.
General Offices: AURORA, ILLINOIS



New Editions

Feeds and Feeding, *by Frank Morrison. The Morrison Publishing Company, Ithaca, New York. $9.50.*

Fifty-eight years after the publication of the first edition, the 22nd edition of *Feeds and Feeding* has been issued. In the publishing field, this book is pushing into the the class occupied by the Bible and Shakespear. It has now grown to 1165 pages and still contains a liberal education on the nature of animal digestion and of the food to be digested; a section on the specific grains and forages; and a discussion of the handling and feeding of the various classes of livestock. Dr. Morrison, who took over the authorship of this book from his father-in-law, the late W. A. Henry, is now assisted in its preparation by the third generation to work on the book.

Forage Crops, *by Gilbert H. Ahlgren. McGraw-Hill, New York. $7.00.*

In a single volume, Dr. Ahlgren discusses the major pasture and forage crops of the United States as well as their cultivation and conversion into hay or silage. In this, the second edition, he has added chapters on pasture and range management and given new emphasis to mechanization of grassland farming, the use of fertilizers, and seed production.

Corn and its Early Fathers, *by Henry A. Wallace and William L. Brown. The Michigan State University Press, East Lansing. $3.75.*

To the Pueblo Indian—and perhaps to other tribes as well—corn and other living objects share the same life as humans. They believe that the thoughts they think of the corn will be recieved by the plant; that helpful, good thoughts will benefit the corn. Beside being the great food staple of their life, corn stands at the very core of their religion which finds expression in their daily life. Because of its importance to them, they have a great desire to know about this friend, corn. Since they have little exact knowledge, they fulfill this desire by creating legends about corn.

Perhaps the authors of this book felt that the corn-belt farmer of today had this same desire for general knowledge about this most important crop for their book fills just this kind of need. None of the information will be of any practical

(*Continued on page* 158)

"One job, and you know it's a farmer's tractor"

"It's just like Oliver had asked all the farmers, '*Now what is it you want most in a tractor?*' Then they built everybody's 'wants' into this Super 77. One man wants power. Well, here's the power to pull up to four bottoms. Another fellow wants his comforts—and here *they* are. Key starting, just like a car. A seat even *better'n* a car. Here's an independent PTO...handy 'Hydra-lectric' controls...even a power shift to move your back wheels in or out! Take the diesel, like I did, and you can knock two-thirds off your fuel bills. You'll say the same as I do: Oliver gives me the power to produce at the lowest possible cost."

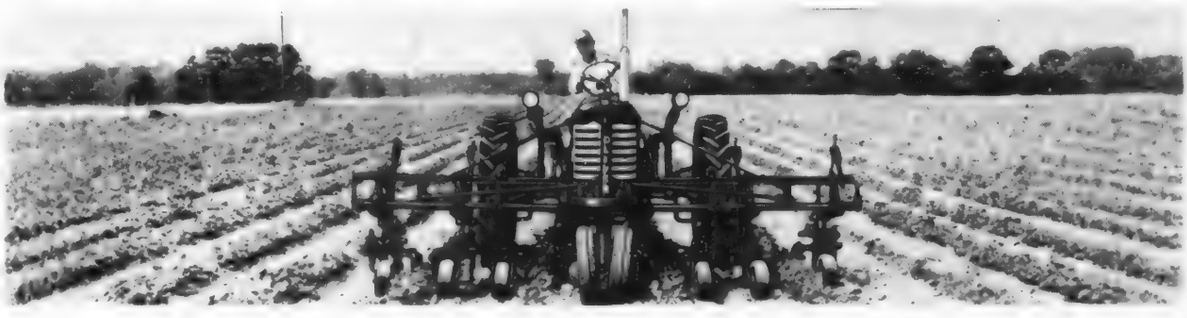
Buy your new tractor
on the
"Pay as you Produce"
purchase plan
Ask your Oliver Dealer

YOUR OLIVER DEALER PROMISES: "You'll never find Oliver dragging when it comes to supplying the features farmers want. That's because the *farmer* is Oliver's big business—always has been, and always will be."

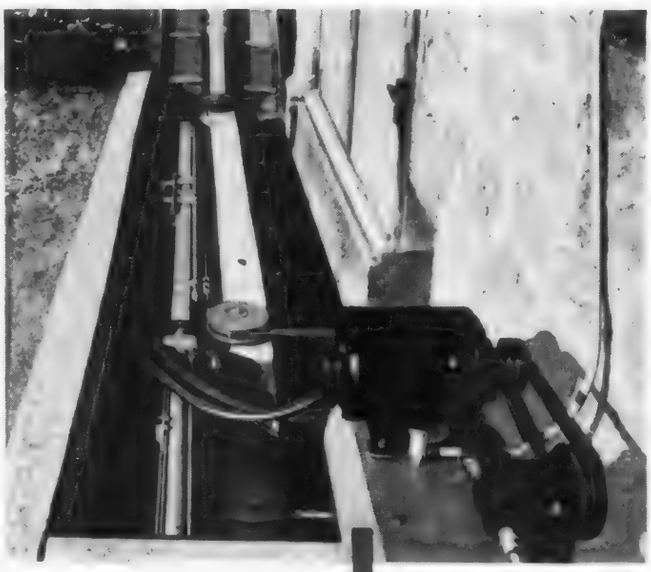
The Oliver Corporation, 400 West Madison St., Chicago 6, Ill.

OLIVER **OLIVER**

"FINEST IN FARM MACHINERY"



New Power Choring from Jamesway



NEW

PISTON-POWERED HYDRAULIC BARN CLEANER

most powerful, economical, strongest, safest barn cleaner ever built

- Big, husky ram with an 8-foot stroke furnishes 2-way power to gutter shuttle-cleaners. Flexible. Safe. Economical.
- Big-capacity, motor-driven hydraulic pump handles over 100 cows in stalls. Plenty of power for bonus capacity with this new hydraulic barn cleaner.
- Shown above, a typical installation. Flexible Jamesway hydraulics let you install the motor, pump, tank and ram inside or outside, lengthwise or crosswise in your barn.
- See your Jamesway dealer for details now. Or write JAMES MFG. CO., c/o your nearest division office. Fort Atkinson, Wis.; Lancaster, Pa.; Los Angeles 63, Calif. Address Dept. FQ-37.

Now Jamesway engineers have taken the genius of Shuttle-Stroke design . . . combined it with the economy and flexibility of hydraulics to give you a brand new barn cleaner that power-cleans gutters *slick as a whistle.*

Famous push-pull action mixes liquids and solids, speeds them to the Liqui-Matic or Flat Bed elevator. High speed elevators can't possibly overload. Won't freeze up either — both models are self cleaning.

Unmatched simplicity and economy are yours with Jamesway's rugged, efficient design. The whole power unit consists of one motor . . . one pump . . . one oil tank . . . one self-reversing ram. It's the strongest ever . . . no gears, no pins, no sprockets to break. No worry about overloading — a safety release valve bypasses oil when pressure reaches 900 lbs. And all drive parts operate in oil for lowest possible wear.

See this revolutionary Piston-Powered Cleaner at your Jamesway dealer's now. You'll agree, no other barn cleaner can touch it for power, strength, safety and lowest possible cost.

JAMESWAY POWER CHORING MECHANIZES YOUR BARNYARD AS YOUR TRACTOR MECHANIZES YOUR FIELD WORK

New Shuttle-Stroke cleaner is smooth in action . . . cheaper to install. Outworks, outwears all others. Does 2 or 3 hours of hand labor while you do other chores. Here's power choring at its best.

Choice of two new all-steel elevators—Liqui-Matic and Flat Bed. Liqui-Matic runs at 8 times and Flat Bed at 4 times the speed of gutter shuttles. Both save the liquids as well as the solids — save the most valuable part of the manure.

$1.00 a day takes backaches away

For a small down payment and $1 a a day, you can own any piece of Jamesway Power Choring equipment. Takes the place of $1 an hour hired man.

Jamesway

FIRST IN POWER CHORING

FOR POULTRY • FOR DAIRY • FOR LIVESTOCK

WILL THEIR "ARTIFICIAL COWS"
HELP YOU PRODUCE MORE MILK AND BEEF?

Down in Indiana, at the Pfizer Agricultural Research and Development Center, they have a herd of 32 "artificial cows" to help solve some of your problems in beef and milk production.

With an ingenious rig of flasks and tubes, Pfizer scientists have simulated conditions inside a cow's rumen, or second stomach. Here millions of bacteria break down indigestible roughage so it can be converted into pounds of milk or beef.

Each artificial rumen actually digests the fibrous material in hay and other roughages!

What does Pfizer learn from these studies? Quite a few things. How, for example, to best use antibiotics in the rations of calves and beef steers . . . how to nourish rumen bacteria so cattle get better nourishment from such low-cost roughages as corn cobs and wheat straw . . . how trace elements added to concentrates influence yield and butterfat content of milk.

As promising new findings come from the laboratory they are put to the practical test with hundreds of real cows or steers. And as soon as a new development is proved out, America's progressive feed manufacturers stand ready to bring these benefits of science to the farm in the feed bag.

Here's one example that's important to beef feeders—the new 5-day "*conditioning feeds*" containing Terramycin®. These new feeds not only help start animals eating and gaining as soon as they arrive on the feedlot, but also help *prevent and treat shipping fever!* These conditioning feeds have recently been proved out and will soon be available from your own feed dealer.

What next from Pfizer—and your feed man? Who knows? Perhaps, from these rumen studies will come a cure for bloat!

TERRAMYCIN® BRAND OF OXYTETRACYCLINE

Science Comes to the Farm in a Feed Bag

Pfizer

Pfizer Agricultural Research and Development Department

Crop Yields Doubled...

and more! with

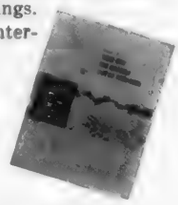
Racebilt
IRRIGATION SYSTEMS

Sturdy and dependable Racebilt portable aluminum irrigation systems give you extra crop and pasture yields every year, regardless of rainfall . . . greater yields mean greater profits . . . life-giving water when and where you need it . . . the most durable systems available. . . take high pressures in stride -- stand up under rough handling !

Every piece of Racebilt irrigation equipment shows the "mark of quality". Race & Race manufactures its own tubing, couplings and fittings to exacting specifications.

Racebilt's famous LINK-LOK coupler is permanently attached to the tubing -- will stand season after season of rough handling, yet functions perfectly. . . uncouples and couples in seconds without leakage.

A complete line of Racebilt fittings is available for LINK-LOK and the moderately priced Economy and Special lines - as well as for the popular Demountable Couplings. All fittings are interchangable.



For the name of your nearest Racebilt dealer and for a free illustrated brochure on irrigation, write to Race & Race, Inc. Winter Haven, Florida

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A few dealerships are available in some localities -- write for details

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Manufacturers of Aluminum Pipe For Farm and Industry

Plow 2¾ extra acres a day at rock-bottom economy . . .

WITH NEW CASE® SYSTEM OF OVERLAPPING Gear Speeds

You never lose time for lack of a gear with the Case 300. When there's power to spare, you shift from 4th to 5th and plow 2¾ acres more in a day. When ground gets too hard or sod too tough for 4th you drop to 3rd and still plow 86 percent as much. For any field speed . . . from 2.2 to 8 miles an hour . . . there's never a gap, always a gear speed to get the greatest results from every horsepower, every gallon of fuel, and . . . most important of all . . . from every precious man-hour.

12-SPEED CASE® 3-PLOW 300

Case Pivot-Action Plows mount on speedy 3-point Eagle-Hitch, track true on contours, cut full width on curves, stay at even depth by floating action. Break-away releases on striking stone, recouples by backing tractor, saves shares. Three and four-bottom sizes for Case 300 and 400 tractors.

Besides the full range of overlapping field speeds, the Case 300 gives you a creeper gear at 1½ MPH, two road speeds of 12 and 20 MPH, three reverse speeds. In PTO jobs your baler, chopper, combine or picker runs at steady, standard speed. You always have a gear speed to suit the crop condition and get the most work done. Start now to get these gains. Case Crop-Way Purchase Plan puts tractor on your place for small down-payment or trade-in, sets later payments at times when you have money coming in. Get full details from your Case dealer.

Mail for Colorful Catalog . . .

Get full story of overlapping gear speeds, full report on world's record fuel economy. Check items that interest you. Address J. I. Case Co., Dept. C-907, Racine, Wis.

- ☐ 3-plow 300 Tractors
- ☐ 4-plow 400 Tractors
- ☐ 5-6 plow 600 Tractor
- ☐ Fuel Economy Report
- ☐ Pivot-Action Plows
- ☐ Eagle-Hitch Implements

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Harvests 35 tons or more of grass silage an hour-it's a FOX

Sharp-shearing rotary type cutting . . . a 116 sq. in. throat opening makes overloading impossible . . . a full 6-ft. mower bar, are only 3 of 20 reasons for the remarkable capacity of Fox Forage Harvesters. Or, if you need even greater volume, the Hevi-Duty Fox cuts a 7-ft. swath, chops and loads in 5 hours what takes most machines 7.

Rugged, lasts for years. One piece rigid frame keeps knives and cutter bar in alignment . . . exclusive safety features prevent damage by rocks or other hard objects entering the knives . . . in-the-field knife sharpening is quick and easy.

Handles all forage crops . . . one man, without tools, can change from mower bar to pick-up, or one or two row corn unit in 10 minutes. For 25 years Fox has been the forage harvester by which all are measured. Your Fox dealer can *show* you why. See him.

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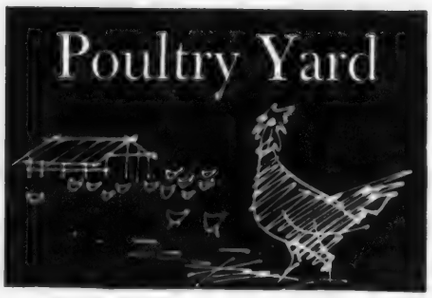


Eggs—Then and Now Revolution in farming? There's certainly been a revolution in the way eggs are produced. I don't know where we're going—but I know where we've been. I just read an article on stresses in the hen yard and I concluded it was lots more fun and a heap less trouble to raise chickens sixty years ago when I was a little girl.

At that time we didn't know hens had stresses. We didn't know they worried or had breaking points and if not handled with care might develop a neurosis. We never noticed any peckers or peckees.

On sunny days the hens were out in the clover patch where they carried on the only pecking system they knew, which was a hunt and peck deal as they pursued bugs and worms. The ones who weren't in the clover patch chasing bugs were wallowing, fluttering their wings like fan dancers in the ash bin back of the woodshed; or scratching for worms in the rich soil around mama's sweet williams and verbenias.

We didn't know anything about drinking founts, either. Our hens drank from the overflow from the horse trough, which papa managed by some magic with the float to keep always dribbling over.

As for sleeping quarters, a flock of them roosted on the rail fence next to the buggy shed. When we kids came home after dark and lit the lantern in order to put old Dobbin to bed, the hens moved grumpily a few inches this way or that on the rail, then they settled down and went back to sleep.

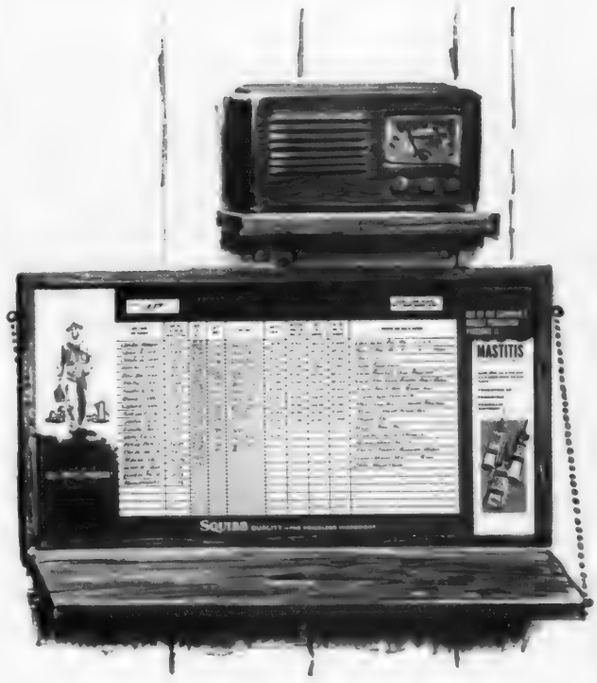
There was another flock that roosted on the limbs of a wide-spreading white oak near the buggy shed. Not hail nor wind nor cold could discourage them. Mornings, the hired man threw them a bucket of grain on some beaten-down ground. They were never sick. They either died of old age or chopped-off heads.

We had roosters so old and tough you couldn't boil them tender in a blue moon, so we kept them on. Mama thought hens had to have roosters in order to lay eggs.

As for hunting eggs, that was my job. It was a daily adventure. I've seen the modern cage-like contraptions that house laying hens. I see the eggs being machine-gunned down grooves and little troughs from somewhere above. To me this is prosaic and unexciting.

My great delight was to hunt eggs, and I mean *hunt*. With a straw-lined bucket with a few glass eggs in the bottom, I took the path by the lilac bushes and past the

(*Continued on page* 150)



Accurate records...

save time for your veterinarian, save money for you

When your veterinarian examines your herd, he's looking for trouble. That's part of his job of Animal Health Engineering: to recognize symptoms of injury or disease while still in the early stages—to make careful diagnosis—to start treatment fast—to keep every one of your animals producing at maximum profit. Here's how you, *and only you,* can help.

Keep accurate records! Save time for your veterinarian, help him save money for you. Always be ready with accurate, up-to-date records for every member of your herd. Make each "case history" as complete as you can, including: date in heat, date bred, date due to calve, date calf dropped, records of milk production and feed consumption. If animals have been treated for injury or disease, write it down! Your veterinarian can help you *faster* when he has *all the facts!*

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ACCURATE RECORDS— MADE EASY! FREE!

Send for your copies of Squibb's new Herd Breeding Chart. It's designed to post on your barn wall, and makes record-keeping simple and easy. Address SQUIBB, *Veterinary Products Department,* 745 Fifth Avenue, New York 22, N. Y., and tell us the number of cows in your herd.

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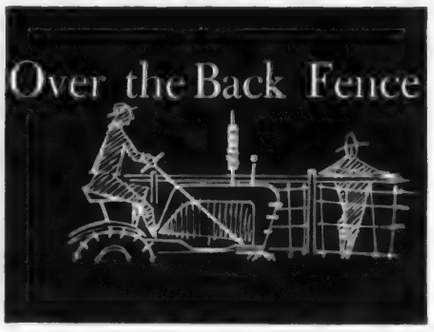


Where are the Apples of Yesteryear? We are old enough to remember the orchard which covered an acre or more near the old home place, and the barrels that were stored in the cellar for winter eating. The apples we buy today on the market seem dessicated and flavorless compared to some of the old-timers, which we haven't seen for these forty years. When we recall some of them we start to drool. Where is the Chenango, or Strawberry, not very big, but red all the way through, and full of flavor; the Maiden Blush, that old pie and sauce favorite; the Russet, spicy and a good keeper; the Pippin, juicy and good eating before the fire on winter evenings; the Sheepnose, or Black Gilliflower, crisp and also a good keeper; and the Early Harvest, early and the component of the first open-faced pies and cobblers in the late spring. Styles do change—we'll have to face that, but what we wouldn't give to sink a tooth into a fragrant Pippin.

How to Cook a Goose Maybe it's because it's getting near dinner time, but the following recipe for roast wild goose seems just the thing to pass on to those among our readers who happen to have a spare wild goose in the larder. As an old goose fancier, let us warn you that a wild goose may live to be 70; if you are unfortunate enough to have one of these old-timers on hand, cook the devil out of him.

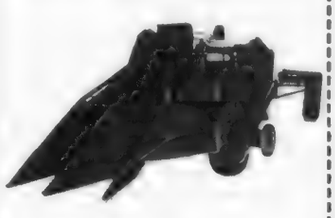
Roast Wild Goose

- 1 young wild goose, 6 to 8 pounds (dressed weight)
- Juice of 1 lemon
- Salt and pepper
- ⅛ cup butter
- ¼ cup chopped onion
- 1 cup chopped tart apple
- 1 cup chopped dried apricots
- 3 cups soft bread crumbs (made from day-old bread)
- ½ teaspoon pepper
- ¼ teaspoon pepper
- 4 to 6 slices bacon
- Melted bacon fat

Sprinkle goose inside and out with lemon juice, salt and pepper. Melt butter in a large saucepan. Add onion and cook until tender. Stir in apple, apricots, bread crumbs, salt and pepper. Spoon stuffing lightly into cavity. Close opening with skewers and string. Cover breast with bacon slices and cheesecloth soaked in melted bacon fat. Place goose breast-up on rack in roasting pan. Roast in pre-heated 325-degree oven 20 to 25 minutes per pound, or until tender, basting fre-

(*Continued on page* 37)

the big one gets a
NEW LOW LOOK!



TOPS IN CORN TOO!

Switch from grain or beans to corn, in a jiffy, with the quick-change corn head. Combine corn in almost any weather. Pick and shell in one trip with an 82 or 92 Harvest Streamliner.

new Massey-Harris Harvest Streamliners deliver bonus bushels in every crop

Here's combine styling, capacity, and ease of handling that picks up where yesterday's best left off. You see it in the new, lower silhouette — almost a yardstick lower — in the lower grain tank, lower air intake, fold-away auger!

This lower design assures stability and safety never before equalled . . . and with no sacrifice of ground clearance. And on the inside, exclusive Balanced Separation — the perfect coordination of extra-wide cylinder, extra-long walkers, exclusive Dyna-Air chaffer — delivers bonus-bushels from every acre.

What's more, you'll find driving these giants is like handling your car . . . with Power Steering, Power Header control at finger-tip command.

See the miracle 82 with 14, 12, or 10 foot cut . . . and the mighty 92 with 16, 14, or 12 foot cutter-bar at your M-H dealers now.

ASK FOR A DEMONSTRATION

You name the time. Your Massey-Harris dealer will be proud to have you work-test a new Harvest Streamliner. For free folder write: Massey-Harris, Racine, Wisconsin, Dept. C-222.

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DIVISION OF MASSEY-HARRIS-FERGUSON

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Voted most likely to succeed . . . in class of '60

Only hours old . . . but there's a good chance this calf will be another champion. If breeding means anything; if feeding means anything . . . this calf has a bright future ahead. Soon she'll be on Red Rose Milk Replacer for a flying start toward building a strong, sturdy body.

Red Rose Milk Replacer is not merely a means of sending more milk to market or raising calves at lower cost. It is actually a *better* way than nature provides. Red Rose Milk Replacer supplies balanced, vitamin-fortified "early nutrition" with the antibiotic supplements that reduce digestive upsets and scours.

Red Rose Milk Replacer means earlier weaning. That's when Red Rose Calf Starter takes over. Red Rose Calf Starter is a pleasantly palatable feed that gives our future champions the proteins, fat, minerals, and vitamins for good solid growth and sturdy bone during the early critical period of rumen development.

Ask your Dealer for facts on the Red Rose Calf Raising Program and free dairy book, calf tape and record charts.

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With General Electric Irrigation Motors . . .

"I grow 10-oz. potatoes where only sagebrush grew"

Early last year, Hollis McClellan, Rupert, Idaho farmer, put 320 acres under irrigation. Before the irrigation system was installed, this land grew only sagebrush. Today, Mr. McClellan has a high yield of top-quality crops.

His lateral ditch flood system is fed by a Layne Pump driven by a new General Electric 250-hp irrigation motor. The equipment was purchased from G. T. Newcomb, pump dealer for Layne and Bowler, Inc., of Memphis. Electricity for the system is supplied from the lines of the Idaho Power Company.

"At my first harvest after irrigating," reports Mr. McClellan, "my potato yield included more than 30% of 10-oz. potatoes—very high for this area." To properly water his potato, sugar beet and seed pea crops, he needs 24-hour-a-day irrigation from June 1 to October 15. This means that his irrigation motor must give reliable, low-cost service over 3,000 hours each season. "That's why I specified a General Electric irrigation motor for my system," he states. "This motor is sturdy enough to take all kinds of weather, and it's more economical than any other drive I've seen. It's real convenient to operate, and maintenance costs me next to nothing."

General Electric's new, weather-protected irrigation motor provides top protection against both storm and rodent damage. The new Vistamatic sight gage permits fast oil check, and the lightweight top cap speeds installation and allows easy access to motor interior. The G-E irrigation motor also makes possible the other advantages of modern electrical pumping, such as low initial cost, push-button starting, and economical operation.

Contact your pump dealer to get all the benefits of an electric irrigation system designed for your particular needs. And save money by specifying General Electric motors for your system. 661-1

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Medium A-C Motor and Generator Department
General Electric Company
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Please send me free bulletin giving more information on the advantages of G-E irrigation motors.

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POWER to lighten every load

(including the load on your budget!)

New Dodge *Power Giant* V-8's develop a full 204 hp. on *regular* gas—up to 31% more power than competitive makes! With *extra* power in reserve, your big Dodge V-8 won't strain under heavy loads. The engine works less . . . wears less . . . needs far fewer repairs!

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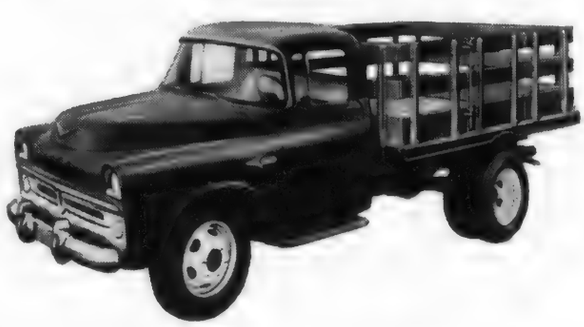
Drive a Dodge *Power Giant* V-8 or 6 today! And get your Dodge dealer's deal before you decide to buy *any* truck!

**Available on all low-tonnage models.*



Take your choice of Dodge farm stakes. Four body sizes—7½', 9', 12', 14'. Max. G.V.W. from 4,500 lbs. to 21,000 lbs.

New DODGE *PowerGiants*

WITH THE *FORWARD* LOOK

MOST POWER OF THE LOW-PRICED 3!

Aerial view of Freeman Farm, Muncie, Indiana. Durable, weather-tight, fire-resistant Armco Steel Buildings include the main barn, implement shed, maternity ward and lean-to housing the milk room.

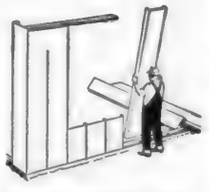
Back in business fast after a fire!

How easy-to-erect, fire-resistant Armco Steel Buildings cut construction time, costs and insurance premiums on this Indiana farm.

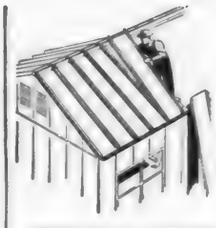
When their dairy barn burned, Ernest and Vernon Freeman of Muncie, Indiana, compared costs and advantages of several types of construction. They decided upon Armco Steel Buildings. The main barn, 40 x 132 x 14, was erected in only 15 days by the Freemans and farm labor, under the direction of an Armco representative. The implement shed and shop, 28 x 100 x 12, was erected by a contractor. The whole project, which also included a 12 x 22-8 x 8 lean-to milk room, and a 28 x 42-8 x 8 maternity ward, was completed nine weeks after the fire. Quickly and at low cost, the Freemans were under roof with durable, weather-tight, fire-resistant buildings requiring little upkeep—and lower insurance premiums!

Fast, low-cost, easy erection is a feature of all Armco Steel Buildings. The reason: precision-made Armco STEELOX® Panels come ready for assembly. Quickly locked together and then bolted at top and bottom, they provide a rigid structure that doesn't crack, warp or rot. Using them, you can meet any floor-space requirements from 25 sq. ft. up for grain storage, implement storage, garages and other farm uses. For complete details, send coupon.

One man can easily handle Armco STEELOX Wall Panels. They fit together for structural support and finished exterior. Nothing to nail; one bolt fastens each section to the base.



Window and door openings are no problem. Short wall panels are used in place of regular panels. They are set in place and fastened the same as other panels to frame the opening.



STEELOX Roof Panels are set in place and held securely by plate and ridge work. Buildings have permanence, but can be quickly dismantled and re-erected in another location.

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Send me information on Armco Steel Buildings for the following use:

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*Approximate size*_____

*Name*_____

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ARMCO STEEL BUILDINGS

"My first Eaton-equipped truck convinced me—

AN EATON 2-SPEED SAVES TIME, WORK & WORRY"

—reports Farmer E. F. Krabbenhoft, Jr., Sabin, Minnesota

"I BOUGHT my first truck with an Eaton 2-Speed Axle back in 1945," says Mr. Krabbenhoft. "For nine years, that Eaton-equipped truck did everything I asked of it—carried heavy loads through deep mud and high snowdrifts, rolled right over tricky furrows without a failure. In December, 1954, I bought a new Dodge with an Eaton 2-Speed. Now I wouldn't have any other axle.

"On most of my 520 acres, I raise certified grain seed. The crop is cut with swather or mower as conditions indicate, then picked up and thrashed by combine and augered into truck on the go. Round and round the field, my Eaton-equipped truck carries a load that gets heavier and heavier. Eaton's low-gear range pulls the truck through, hauls the load to our seed cleaning plant without delay or trouble.

"Putting a conventionally equipped truck through this kind of work would result in stripped gears, excess engine wear, plenty of broken axles. But that Eaton 2-Speed can take it. We've had no axle maintenance expense—saved on oil and gasoline. For me, it will always be an Eaton-equipped truck."

In the field or over the road, an Eaton 2-Speed assures top performance at lower cost. Ask your dealer today for a demonstration.

"IT'S NO CHORE to drive an Eaton-equipped truck over the highway," adds Mr. Krabbenhoft. "Eaton's 'push-button' shifting makes driving easy. In the high-gear range, you can make legal speeds without punishing the engine, and in low-gear range there is plenty of pulling power."

DODGE DEALERS Bud Hustad (*left*) and his brother John talk things over in front of the Hustad-Kelly Company showroom in Fargo, North Dakota. "The Eaton 2-Speed Axle is just about a standard piece of equipment for farmers around here," say the Hustad brothers. "Farmers have found it's simply uneconomical to operate their trucks without an Eaton 2-Speed Axle."

EATON

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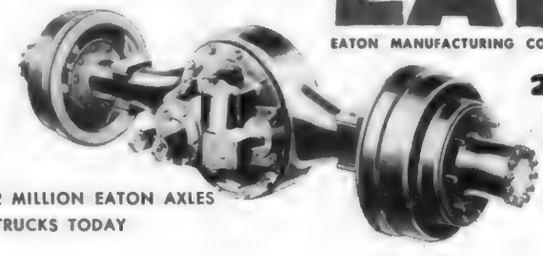

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2-SPEED TRUCK AXLES

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OVER THE BACK FENCE

(*Continued from page* 30)

quently with bacon fat and drippings in pan. If age of goose is uncertain, pour 1 cup water into pan and cover last hour of cooking. Remove cheesecloth, skewers and string. Serve with red cabbage, corn fritters and ale or beer. Makes 6 to 8 servings.

Sweeping Inflation Just when we thought we had everything under control along come the broom makers of the nation to say brooms are going to be higher this year. If you want a new broom in 1957 you'll have to pay twenty-five cents more than you did for your 1956 broom. The reason for this raise, the broom makers insist, is that the broom corn crop in 1956 was only half what it should have been. Broom corn growers received $445 a ton for their 1956 crop, which goes into 1957 brooms, as against $223 a ton paid in 1955. This might be a tip for the farmer looking around for something profitable to plant.

Hands Across The Sea Someone has said that the way to settle the British is to drop a few U. S. politicians on them. Well, it's too late—they have their own who are doing as good, or better, a job of confusing farmers with their regulations as are our U. S. variety. The following, from *Pig Farming*, an English magazine, is a valiant but fruitless effort to explain a quirk in the English market:

"There has been a good deal of bewilderment in the markets, because the stabilizing adjustment to the guarantee payment has not operated when many farmers thought it should.

(*Continued on page* 152)

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FAST, SMOOTH-HANDLING, EASY

Makes Gardening FUN!

ROTO-HOE doesn't jump around, doesn't have to be jiggled, joggled, jounced and bounced along. It's smooth, easy, pulls itself along with minimum guiding assistance from you. You'll get all the pleasures of growing your own fresh vegetables and beautiful flowers—without the backaches and weeding problems. The famous ROTO-HOE will do a better job for you—tilling, cultivating between the rows in a fraction of usual time. You'll have a better garden—and more time to relax as well. Complete 2 h.p. ROTO-HOE only $129.50.

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And, don't forget—Corrulux is the ideal glazing material for cold frames, hot beds, and greenhouses. Diffused light for maximum growing area.

Standard roofing widths and lengths. Flat or corrugated. Complete color range.

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- Tractor Sheds
- Milk Houses
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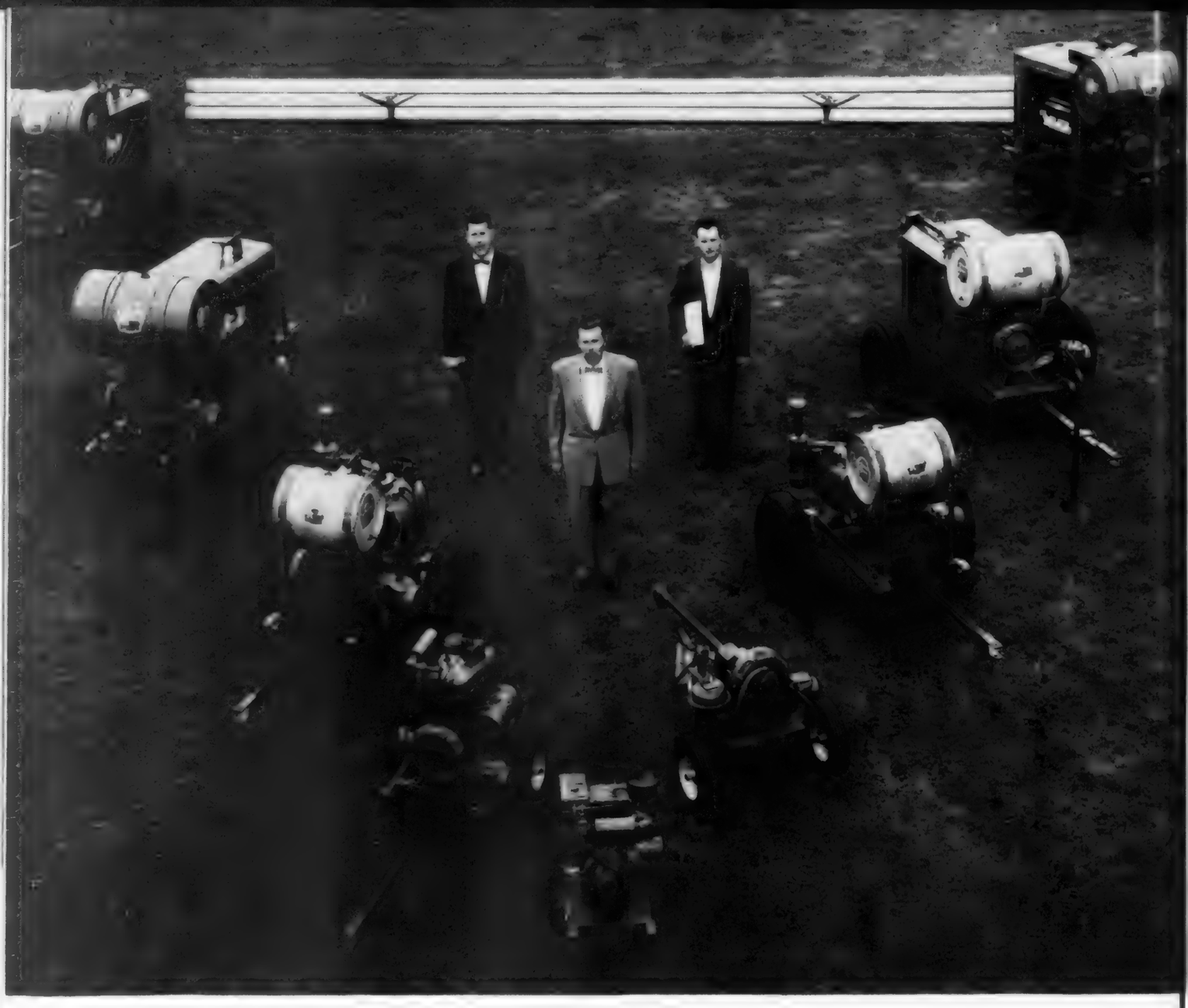

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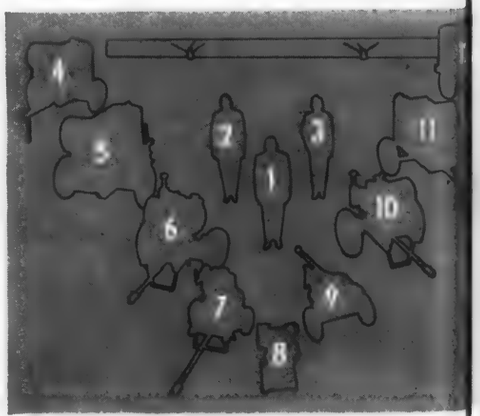

Pictured are (1) Mr. G. Wesley Cadman, (2) Mr. Arthur L. Cadman, (3) Mr. Andy Kesteloot of Cadman Power Equipment Co., Courtland, Ontario. Gorman-Rupp Irrigation Pump models shown are: (4) 55A-265, (5) 55B-IND30, (6) 54A-VG4D, (7) 53M-TFD, (8) 6201, (9) 64A-G, (10) 53H-VF4D, (11) 54M-CJ3A, and (12) 55M-IND56.

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Money on the Wing

A PACKAGE of 10,000 bees will increase to 60,000 in eight weeks and go right on making honey. This simple little habit of bees of increasing in geometrical ratio appears to be an easy way to make money. You buy a package of bees, parlay them, and you're in business, with the bees doing the work.

It isn't that easy, as Harry Whitcombe found out. Whitcombe is one of the biggest bee men in the country. He runs his operation out of Davis, California. Marie, Harry's wife, is as much responsible for the success of the business as her husband, and the two ought to be teamed together in prose as well as bees. They have made a whopping success, but it wasn't easy.

The Whitcombe's have combined three essential elements of success—a thorough knowledge of bees, hard work, and a shrewd sense of business. A good example of the latter is the way they exploited what might be called the three dimensional talent of bees. A bee does three things very well indeed; he gathers honey, he manufactures beeswax, and he pollinates fruit and flowers.

The Whitcombes exploited all three, thereby establishing a sort of three-way insurance against failure.

Harry Whitcombe started in the bee business about thirty years ago, when he was still in knee pants. He doesn't remember his first interest in bees, but he does remember the first bees he owned; he bought them with the pennies he shook out of his piggy bank. By the time he was ready for college he had eighty hives and a good bee background gained from his own bees and from working in apiaries during summer vacations.

When he was graduated from high school he wanted to go to the College of Agriculture at Davis to learn more about bees. However, family finances were low and he found that if he was to get any college bee learning there was only one way to get it—sell his bees. He loved every one of them and it was a hard decision, but sell them he did.

At Davis he waited tables, organized an odd job pool, worked in the bee laboratory, and on the side, acquired more bees. By the time he had finished school, he had accumulated 100 hives and Marie, who shifted from horticulture to bees and became a full-time partner. They lived in a midget-sized apartment under a water tower and kept their eyes peeled for an opportunity to try out some of the dreams they had about making a fortune in bees.

In 1938 they saw what they wanted in Nevada. A bee keeper there wanted to lease his 500 hive apiary. Stacking supers (an extra story for a hive) on his 100 hives in Davis, Harry and Marie set out for Nevada with fifty dollars in cash and a truck load of five-gallon cans. The weather closed in and for days the bees sulked in their hives. But when the sun came out they exploded into a sun-to-sun schedule. One hive which Harry had set on a scale showed twenty pounds of honey gathered in one day. By the end of three weeks the honey flow was over, but the truck load of cans were filled with clear, fine-flavored honey. The Whitcombe's share of the take was 80,000 pounds, which they sold at six cents a pound—$4,800 in cash in less than a month. But they had uncapped combs and whirled honey for eighteen-hour stretches, day after day, working as hard as the bees.

By the summer of 1940 the Whitcombe's original 100 hives had increased to 1000 and these were producing 100,000 pounds in a season. The hives were moved about a good deal to catch the various nectar flows as the trees and flowers come into bloom. Bees have a strange and unexplained trait of gathering only one type of honey at a time. When the orange trees are in bloom, a bee will work orange blossoms exclusively, and all other flowers are shunned until the nectar flow stops in the particular flower they are favoring. Each bee makes its own selection of nectar source though usually all bees in the hive will be working the same blooms. If there is a sudden termination in a particular nectar, the comb might show where one stops and another begins. This trait works out very well for the horticulturist and fruit grower, for cross pollination of only related varities is achieved.

Round about Davis and within hauling distance are a wide variety of wild and

Photographs for Farm Quarterly by Joe Munroe

Harry Whitcombe assembled this truck hoist (right) to take the strain out of lifting honey-laden hives. A motor on the cab operates the hoist. Whitcombe shakes bees (left) into a package for shipping. The package will contain 3 pounds of bees, a queen, and a can of sugar for food during the trip.

cultivated blooms which are staggered conveniently for the bees. Apple, pear, cherries, almonds, prunes, and apricots, among the fruit and nut trees, and button sage, cotton clover, alfalfa, and star thistle among the cultivated plants and wild flowers, each produce a distinctive honey. Some apiarists have established apiaries in spots where they glean honey from exotic and rare flowers and are able to sell their product at a premium. In the Sierra Nevada Mountains, for example, honey made from bear clover, manzanita, cedar, honey dew, wild lilac and various sages sells for upwards of a dollar a pound when ordinary honey is bringing twenty cents.

For a good many years the Whitcombes confined their business strictly to honey production. When the war came along and sugar was rationed, honey boomed, and the Whitcombes found themselves in clover with their bees. Beeswax, too, became a critical military item. Used as a coating for guns in shipment, it brought as high as forty cents a pound. During the war the Whitcombes sold 3,000 pounds a year to the Army through brokers. Beeswax is a profitable by-product of honey production and there is a steady market for it during peacetime for cosmetics. In extracting honey from the comb the top of the comb is sliced off, the comb placed in a centrifugal machine, and the honey is whirled out of the wax comb. Some of the wax is used as foundation for new frames, but the bulk of it is sold.

While he was at Davis, Harry was always trying out new tricks with bees. Most of them were designed to make the bee work harder and longer. For example, he reasoned that if he could find a way to get a hive into top production earlier in the spring, he would profit by the greater volume of honey. He designed a contrivance to brush the pollen off the bee as it entered the hive with its load of honey. The pollen was collected, stored over winter, and fed very early in the spring to expedite the production of workers to a booming population. Incidentally, there is a small but profitable market for pollen in manufacturing anti-hay fever nostrums.

While Whitcombe was still young and optimistic, he figured that he could make a million dollars in bees and retire at forty. "At the time," he says, "it seemed like a mathematical certainty. If I divided each colony yearly, raised queens to start new colonies, and built up a large package-bee business, I couldn't miss."

But mathematics couldn't tell him that the price of honey would at times go down almost to a vanishing point; that arsenical sprays would almost ruin his business in one season; and such things as bears and horses and bad weather, and even laws, could knock his success schedule into a cocked hat.

The greatest blow came in 1943 when the tomato growers in the area around Davis went to plane dusting with arsenicals. The year before there had been a few fields dusted by plane, and bee keepers had some losses. But they studied the dusting patterns and saved most of their bees by moving them ahead of the dusting. However, in 1943, with labor shortages forcing tomato growers to go almost exclusively to the air, there was no escape. The bees, mistaking the dust for pollen, gathered and stored it. The workers died, and the young brood were fed the poison, and the hive perished. By fall 2,500 of Whitcombe's 3,800 hives were destroyed. He took a loss of $25,000 and was left with scarcely more bees than he had when he left Davis several years before.

Stands placed in isolated country to gather nectar from mountain flowers were regularly raided by bears, and once a horse kicked a dozen hives into kindling wood. The stands had been placed under the horse's favorite shade tree. When he sought the shade the bees stung him, he mounted a counter attack with his heels. He died of stings and Whitcombe not only lost his bees, but had to pay for the horse.

For a number of years Utah laws prevented the transportation of bees across the state line and a profitable pollination business in the alfalfa fields, paid for by the honey gathered, was lost to California bee men. The production of seed also dropped. A running battle against the indiscriminate use of arsenicals was resolved when DDT came along and solved the problem. Ordinary applications of DDT have little harmful effect on bees.

Not the least of the obstacles which the Whitcombes had to overcome was the ignorance and prejudice of fruit growers and farmers who were slow to learn that the bee is the key figure in fruit and seed production.

The crusade to teach farmers the value of the bee in crop production had started many years before and Harry Whitcombe and his fellow bee keepers were links only in a long chain of dedicated men who carried the torch. While Harry was at Davis, he was a disciple of George H. Vansell, who was regarded as the top authority on the function of the bee in the pollination of crops. Vansell spent his life in educating the orchardist and farmer. By the time Whitcombe was in business for himself the ground work had been laid and the sale of package bees for pollination purposes, and the leasing or renting of hives on a seasonal basis was well-established. Whitcombe concluded that there was more money in bees as pollinators than in bees as honey makers.

One of the most stubborn groups to convince that bees make a seed crop were the alfalfa growers. The growers' argument that honey bees are unimportant in alfalfa seed production had a good deal of truth in it on the basis of the number of hives they were then using. The growers say that honey bees rarely pollinate an alfalfa floret because of its peculiar structure. When a bee enters the top of the floret and thrusts his proboscis into the throat to take the nectar, the tip of the sexual column snaps up like the trigger of a trap, giving the bee a sharp whack on the head. This forces the bee's head against the petal, at which time grains of pollen lodge on the hairs of the head. When the bee visits the next floret, some of these grains are left and cross-pollination results. The bloom will bear seed.

The bees, learning that every time they enter an alfalfa floret they can expect to be knocked dizzy, have worked out a method of avoiding the blow. They stick their tongue in at the side openings of the blossom and take the nectar, but little pollen is dusted on them.

Vansell and his followers learned that if the bee population were large enough there would be enough reckless bees, or bees that didn't know the score, to trip the blossoms. As soon as the whole hive gets hep and works out the side door entrance idea, they are moved and a new colony is brought in. This is the method used today. One of the big items of education was to overcome the farmer's disinclination to spend the money necessary for a big bee population, which is established at four or five hives to the acre.

The use of bees as pollinators has probably its highest development in the west and southwest. The possibilities in the clover seed producing areas of the north central states and the use of bees as pollinators in the orchards of New England and the Midwest is only now developing. These areas are sources of demand for package bees and for the beekeepers' services. While California leads in the package bee business, the south also supplies many bees to northern beekeepers. The center of this southern bee business is in Mississippi.

Whitcombe's Bees Up-to-Date

After the setback given Whitcombe's bees by poisonous spray, he built up his stands to 2500, which is the number he owns today. Of this number he leases all but 750. which he says is about the maximum one man can handle. Whitcombe is also in the alfalfa seed business and uses his own bees on 500 acres of seed. The use of bees for pollination of alfalfa, carrots, onions, and the various orchard crops is now generally accepted throughout the west and southwest.

The fees charged for pollination vary. During the early spring, the going charge for a hive for the pollination of almond trees, the first to bloom, is from $1.00 to $1.50 per hive. The almond growers use two hives per acre of almond trees. In the pollination of alfalfa, the beekeeper's fee is sometimes based on the seed yield, somtimes a flat fee per hive. Whitcombe was one of the first beekeepers to ask and get a fee for pollination of alfalfa. 'Before we started to charge for alfalfa pollination," he says, "we set our stands in alfalfa fields and our only profit was the honey. We

sometimes even had to share this with the farmer. After they learned that bees would greatly increase the yield, we began to charge. I went to one of my neighbors, Stan Good, one year and told him that I would have to charge him for the use of my bees. He objected, but after he saw the returns, he was happy."

When alfalfa seed was selling for $1.25 a pound, beekeepers made a handsome penny on the increase in yield. An ordinary field without bees would produce 200 to 300 lbs. per acre of seed. With up to 12 hives of bees on an acre, the increase went up to as much as 1,000 lbs. of seed to the acre. The beekeeper's commission on the yield was $100 per acre for his bees. The price now fluctuates with the price of seed, which is now down to around 25 cents, with a correspondingly low rental for each hive of bees. Some alfalfa growers prefer to contract for bees on a straight rental basis. The price in 1956 was around $3.50 per hive for two hives per acre.

In addition to the rental as pollinators, Whitcombe takes from 35 to 50 lbs. of honey out of each hive per season. Strained honey is now bringing 12½ cents per pound. From each hive, also, up to 4 lbs. of bees can be shaken out and sold as package bees without harming the honey-producing potential of the hive. Last year Whitcombe sold 10,000 lbs. of bees.

Bees are usually packaged in 2 to 3 lb. boxes, each with a queen and each box provided with a can of sugar sirup to

(*Continued on page* 86)

Whitcombe catches a queen (above) and prepares to pop her into a shipping cage (left). Into the cage goes a capsule of sugar and a few workers to take care of her. In the spring, to boom increase in workers, Whitcombe feeds his bees (below) with granulated sugar poured directly into the hive.

By John F. Hughes

Hog specialists who practice multiple farrowing reduce the marketing gamble, lower the overhead per pig, and increase their labor efficiency

Does Multiple Farrowing Pay?

ON A COLD WINTER DAY a few years ago, Walter McMechan stood in the Terminal Exchange Building looking at hog quotations on the big market board. "Here are hog prices at a new high and me and the other boys without a hoof on the market," he thought. This day, when hog prices hit $22 a hundred, McMechan was on the market with some steers. "When I get my hogs ready for the market," he thought, "it will be the old story —every pen full and prices down. Well, by George, here's one boy that's going to change all that. I may not miss the low markets, but I'll have some pigs selling on the high market, too."

When McMechan got back to his Union County, Indiana, farm that night he began the planning that has changed his farm from a general operation to a year 'round pig farm. With the help of his attractive wife, Roberta, and his son, Jimmy, and even from his 9-year-old girl, Joy, he has nearly completed the conversion. He keeps 60 to 65 brood sows and markets 1,000 hogs a year. Some years he buys 20 to 25 feeder cattle, but essentially he is a hog raiser.

Specialization and volume production is the trend in farming today, whether it be in poultry, livestock, grain or dairying. We have seen broiler production become specialized until today many a Midwest farm doesn't have a bird on the place. Now the hog farmer is becoming a specialist in year 'round volume production.

With this specialization has come multiple farrowing. Multiple farrowing—more than two farrowings a year—is not a new idea, but in the past few years this method has been getting more and more followers. One of them, of course, is Walter McMechan.

"The conversion to our present set-up was a gradual process," said McMechan. "Before the change I never sold more than 400 or 500 hogs, and a few cattle, each year. A good bit of our income was from cash grain. I started handling more livestock when I figured I could make more money feeding than from selling the grain outright. That's when I put a concrete feeding floor behind the barn. I did a lot of thinking and planning when I decided to have more than two farrowings a year. The change started when I decided to have a bunch of hogs for market in late December. You know, it's always nice to have a little Christmas money, especially with two youngsters in the family.

"We had good results with this extra season bunch of Christmas hogs, so we decided on more farrowings. We worked up to having 10 sows farrow every 2 months. That's when I realized that multiple farrowing wasn't without its problems. It's hard enough trying to keep on a breeding schedule with two farrowings a year. Here the difficulty is multiplied. Keeping each bunch of sows in a separate paddock is my method of coping with this never-ending problem. And even then you have trouble, when a sow doesn't settle, or when a boar proves to be a nonbreeder. Because there are always unforeseen difficulties you have to be elastic and adjust to each situation as best you can. No book can answer all your problems for you."

All of McMechan's livestock is raised on the 190-acre home place. The additional 170 acres that he rents are for crops only. Today McMechan keeps between 60 to 65 sows and four boars. He believes that he could probably get by with fewer boars, but feels safer having too many rather than too few. Each boar is kept in a separate paddock, and at breeding time only one is turned in with the sows. Even without the rented land he figures he could handle 800 hogs and 25 cattle each year.

The 190 acres on the home place has 172 tillable acres and is set up for 86 acres of corn, 43 acres of small grain, and 43 acres of pasture. About half the pasture is utilized by hogs, the remainder is for cattle and hay. The pasture land for hogs is divided by temporary fencing into three- and four-acre lots.

Rigid sanitation is practiced on this Indiana stock farm. McMechan realizes that a disease outbreak could really foul him up, so he rotates his pastures each year. This calls for some fence moving and some extra work. He figures that it takes him about five to seven days a year moving his hog fences. Hogs return to the same pasture once every four years. The rich legume pastures that are being used this year had portable corn cribs placed in them during the fall of 1956. The 1956 corn crop was put directly into these cribs at picking time, and the hogs will empty the cribs themselves. "These portable cribs are labor-savers for us," said McMechan. "Once the corn is in the crib, we never handle it again."

McMechan works his rotation like this. First year corn; second year rye cover, and then corn again; third year wheat or oats; fourth year clover pasture. From the amount of manure he gets from the live-

stock on this place, he feels he is actually building the soil.

"I'm not doing anything extra special," McMechan said, "there's nothing fancy here. Instead of having two farrowings a year, and marketing twice a year, I now have pigs coming all the time and market over the whole year. A lot of people look at me kind of funny when I tell them how many times I had hogs on the market last year, but here are my records:

Date	*No. Head*	*Price-Cwt.*
Jan. 3	158	$12.25
Feb. 16	58	$12.15
Feb. 23	21	$11.75
March 2	60	$12.35
March 5	32	$12.10
March 21	62	$15.00
April 19	60	$15.25
June 7	84	$16.60
July 13	92	$16.25
July 25	57	$16.50
Aug. 17	59	$17.10
Sept. 19	95	$16.50
Oct. 3	27	$16.40
Oct. 16	59	$16.50
Oct. 17	30	$16.50
Nov. 16	55	$15.00
Nov. 28	54	$15.75
Dec. 7	14	$17.00

"I hit some low markets, but I also hit some of the better ones last year. No one knows when hog prices will be good again but when they do get up there, I'll have some hogs to sell.

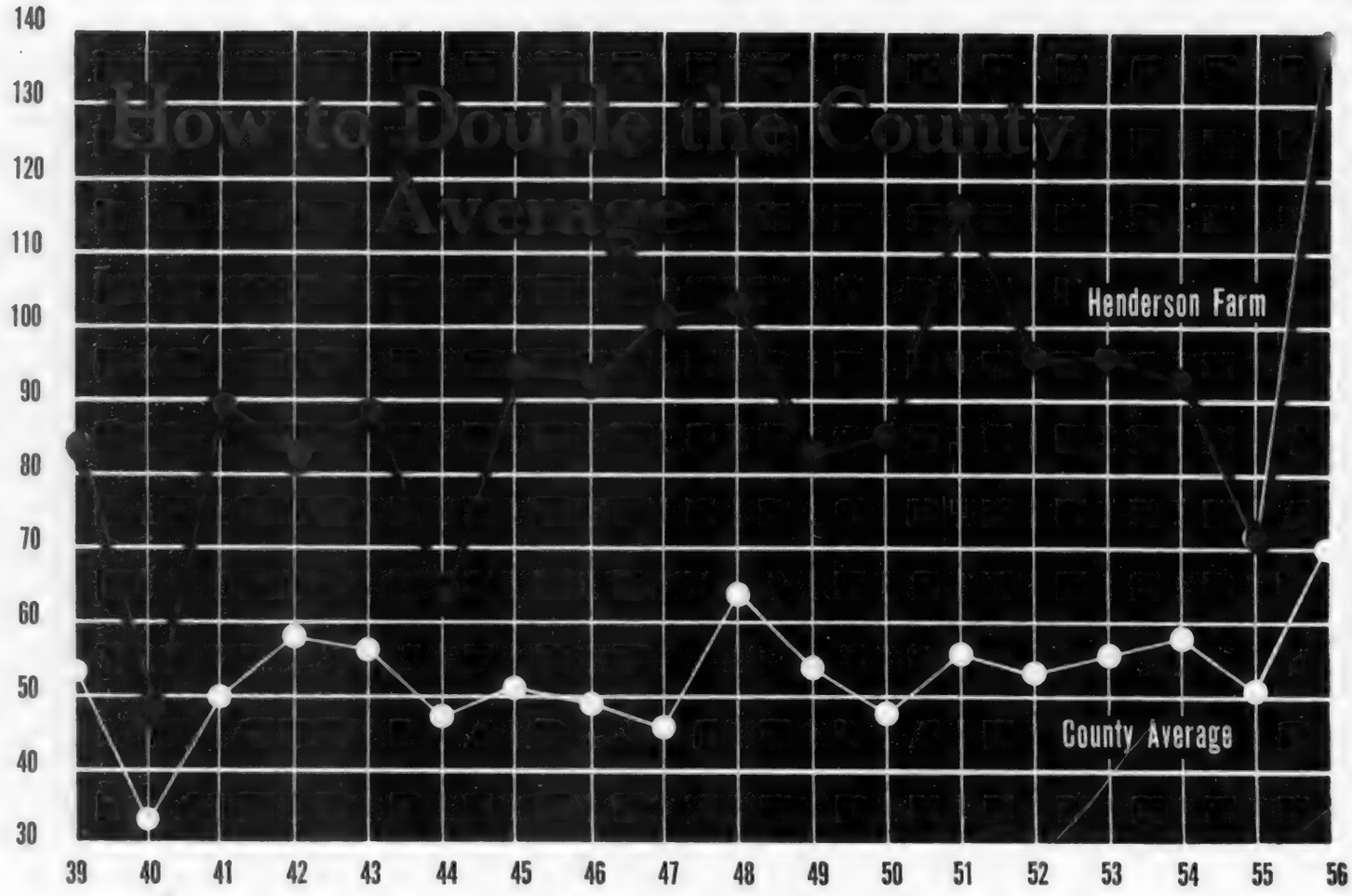
"The rising cost of equipment is another reason why I decided to go all out for hogs. I just couldn't afford to buy equipment and let it lie idle. When I started farming on my own in 1936, I bought hog coops for $14.75 each. In 1955, I bought the same kind of coop, but paid $63 for it. At that price I have to keep it in use all the time to make it pay for itself. I'm no different from the next guy; I want the most return for the least investment."

On a $400 movable hog house the Department of Internal Revenue allows 10 years for depreciation, or $40 a year in this case. If 40 hogs use this house in a year's time, the cost of depreciation would be $1.00 per pig. If 160 pigs use this house in a year's time, the depreciation cost is 25 cents per pig.

"All my pigs are farrowed in either small coops or movable houses," McMechan said. "When I converted to multiple farrowing from the two-a-year system, added expenses amounted to very little, considering that I have more than doubled my hog production. I had to buy a few more feeders, water tanks and

(*Continued on page* 99)

Walter McMechen (above left) has arranged farrowing pens and feeders so that much of his work can be done from the tractor. Ray Fields (right) converted a calf shed into a farrowing house when he changed from general farming and became a hog specialist.



Without increasing acres, Alfred Henderson doubled his corn yields, tripled the meat raised per acre, and cut his labor force. He accomplished this by long-range planning

By Grant Cannon

IF THERE WERE an All-American team of Master Farmers, Alfred Henderson would be a powerful contender for the title from Indiana. And this would be a good year to pick Henderson, for this year, which begins the fourth of the five-year plans that have been worked out for his Mermam Farms, has been a dazzler. From the point of view of production he has averaged 137.4 bushels to the acre on 186 acres of corn, and his corn, oats, and pasture land have made it possible for him to produce 638 pounds of meat for each acre of his 479-acre farm.

This past year was fabulous for corn growing in Indiana. As Henderson, himself, said, "A year for corn like 1956 comes only once or twice in a man's life. I'm seventy-three now and the nearest thing I can remember to this was back in the twenties when we had a near-perfect year and made seventy-five bushels to the acre with open-pollinated corn. But then, 1955 was about the worst corn year I've ever seen here on the farm, so things have balanced out."

In this balancing out, Mermam Farms show an average corn production above 100 bushels to the acre for the past five years and a meat production per acre that has risen from 189 pounds per acre in 1939 to 359 in 1944, 425 in 1952, and 638 last year. This is what long-range planning will do. The results of planning are pointed up when you compare this 100-bushel average with the average for the first five years, which was 61 bushels, with 87 bushels for the high year; and with the second five years where the average yield was pushed up to 77 bushels, with a high of 101 bushels for 1948. And just to put the frosting on the cake, he has done all this with no great outlay in fertilizer, with less labor, and in doing it he has banked thousands of dollars worth of fertility into the soil. The one item he has paid cash for and added to his farming is—brains for planning.

In some ways, farming is like a war. In a war the field commanders carry out the day-to-day tactical plans which must be varied and modified to meet the changing situation. But with all of the adjustments and accommodations, these tactical plans must fit into the over-all plan, the grand strategy, if the war is to be won. Henderson, like most successful farmers, is a master tactition—the daily operation of his farm is smooth and efficient. As an over-all planner, a strategist, he is no slouch either, but in this field he felt the need for the help of other minds, specialists to gather information, to present new plans and ideas, and to test and check his own long-range plans. He wanted long-range planning by experts and, in a sense, he had a part in creating the agency that gave him what he wanted.

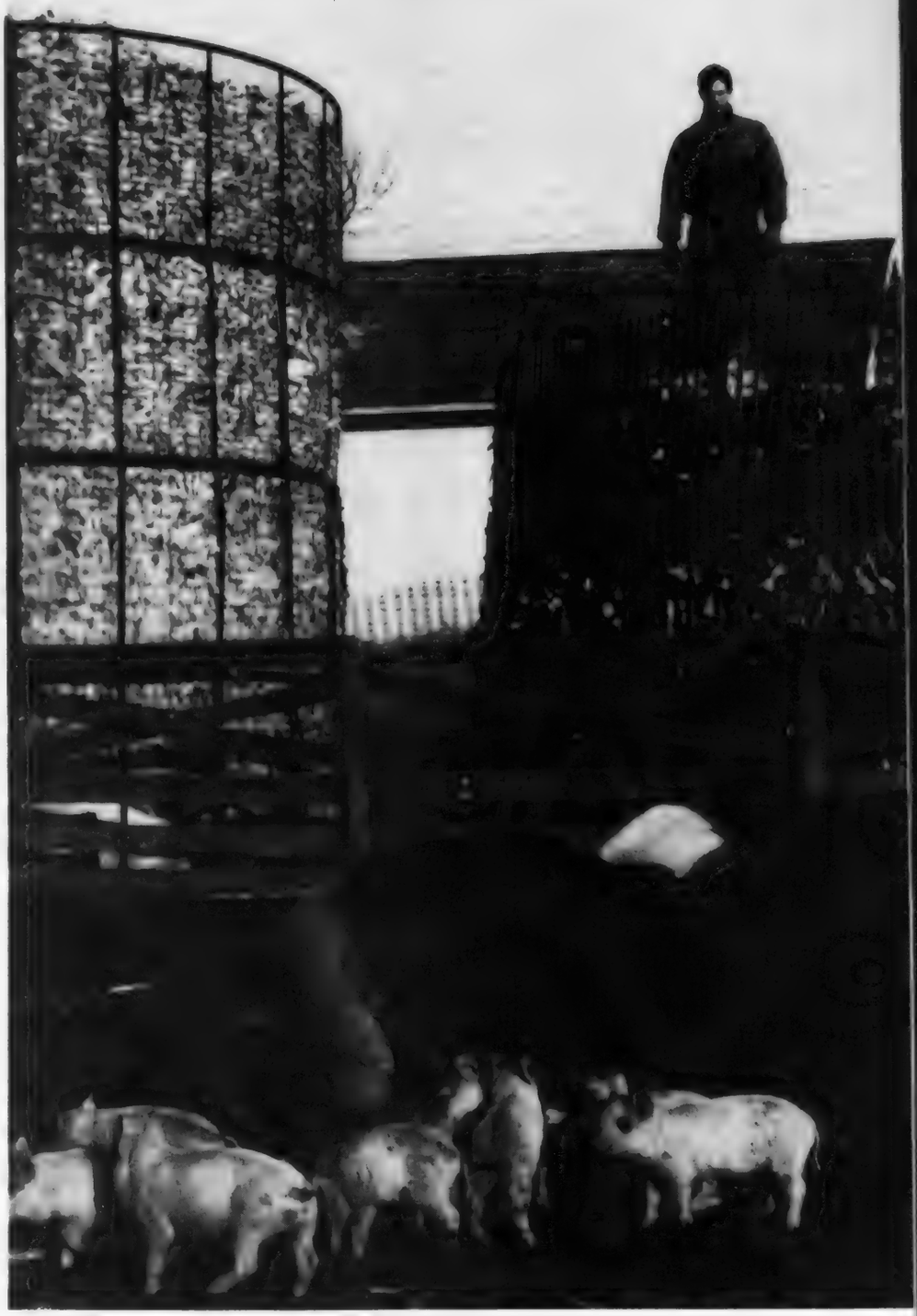
This came about quite by chance in 1938 when he happened to meet an old friend, the late C. M. Long, at a very critical moment in the latter's life. Long

mentioned that he was quitting his job as extension agronomist at Purdue University and going into business as a farm consultant on soil conservation. Henderson's reaction to Long's new venture was violent but constructive. "Look, C. M., I'm a good farmer and I was one of the first to get out and plug for soil conservation, but I wouldn't pay you a bent penny for the kind of job you want to do. What I want is someone who can take all the latest findings of the scientists—all of the stuff that is published in the scientific journals and bulletins which we farmers don't have time to keep up with—and apply this stuff directly and specifically to my farm. Now, if you were willing to do a job of reviewing and overhauling my farming thinking, I'd be willing to pay well for the job—and so would a lot of other farmers, and I mean good farmers who could afford it."

The idea of selling management analysis to good managers was a novel one. It took a lot of arguing back and forth to iron out the concept and it took four different reports, prepared by Long and criticized and rejected by Henderson, before they came up with the kind of farm report which Long felt was worth doing and Henderson felt was worth his money. This first report has been followed by three more on this farm and by hundreds of others on other farms. It has been refined and enlarged in many ways, but it is still the recognizable model for them all.

To work out an over-all plan for a farm, Long began with the soil, an analysis of the kind of soil that existed on the farm and just what each soil type was like, how it responded to tillage, the kind of drainage it provided, its reaction to freezing, the kind of crops which it was best suited to grow. Though Long described the three predominant soil types on the farm under their standard names, Brookston, Miami Silt Loam, and Crosby Silty Loam, he was careful to point out the exact nature of each of these three general types as it appeared in the soil on the Henderson farm.

Long then took soil samples from every acre of every field on the place. And here he uncovered a surprise for both himself and Henderson. On this farm, which certainly would have been called one of the best in Indiana, he found that from the point of view of fertility, this prosperous farmer was practically broke. The soil tests showed that all but 10 acres needed four tons or more of lime to the acre and that the ten "good" acres needed three tons and that every acre on the farm was very low, dangerously low, on both phosphorous and potassium. An analysis of Henderson's fertilizer use and the requirements of the crops he was growing showed further that except for nitrogen, which he was putting into the soil through legumes, he was drawing more fertility from the soil than he was putting in. In other words, in this fertility bank, the farm had used up its capital and was going into debt.



A pig's eye view of M. L. Smith (above) also shows some of the temporary storage needed to hold the overflow after filling the cribs. This corn was grown on half the acres planted when the cribs were built.

With Alfred Henderson reading the facts from the farm books, M. L. Smith figured that meat production had increased 330 per cent since the start of long-range planning.

Starting with the soil, its slope and structure and fertility, was fundamental with Long, who had spent his childhood and adult life in agriculture—he was, in fact, one of the first County Agents ever appointed in the United States. With the facts about the soil in his hands, he was ready to go on to what *could* be done. Different sets of rotations were worked out for different parts of the farm, depending on the soil type. These rotations ranged in complexity from a two-year rotation of corn and soybeans with the beans turned under every third crop, to a five-year rotation of wheat, red clover, sweet clover sowed into the red clover, corn, and oats. The fertilizer recommendations which Long made were even more radical, for that time, than was his shifting of the rotations.

In the past the fertilizer added to the soil had been from 75 to 100 pounds of 0-10-10 for corn and another 100 pounds of 2-12-6 for wheat—which was as large or larger than the neighbors were using. Long figured up the amount of fertility that was being taken from the soil by the crops and added to this a modest amount to be banked in the soil to build it into a more productive farm. This raised the fertilizer requirements to 400 pounds of 0-12-12 for the alfalfa, 100 to 150 pounds of the same mix for corn, 150 to 200 pounds for oats, and from 150 to 250 pounds, still of 0-12-12, for wheat. At the time, this was considered an outlandish amount of fertilizer that only an experimental farm would try (though the experiment stations *were* trying it and finding it profitable). In addition to this fertilizer, Long recommended adding two tons of lime to the acre and specified which fields should receive it first. In all of this, Long, who was a staunch Republican, was operating like a soils Socialist—from each acre he demanded crops according to its ability to produce and to each acre he gave fertility according to its needs.

Long's planning did not stop with soils, crops, and fertilizers; nor was this important part of the plan made without considering the livestock operation for the farm. The major change in livestock management that Long recommended was to urge Henderson to change from the corn feeding of heavy cattle to buying western calves and feeding them mainly on grass and hay with a final fattening of corn. He also urged that as much of this feeding as possible be done in the fields so that the cattle could spread their own manure. To accomplish this he recommended trench silos (this was back in 1938 remember) and field-stacked, chopped hay protected with snow fencing. He also recommended increasing the hogs on the place to take care of the corn he planned to save with the new cattle program.

This was the practical, fact-filled report that Henderson felt was worth his money. It was the kind of report which other farmers, when they heard of it, were willing to buy. It put Long in business, a business named The Farm Clinic, which expanded to include two associates, Marshall Allman and William Yaw, and which continued to grow and to outlive Long himself, who died in 1951. And the business has continued to serve Henderson, for in 1956 Allman and Yaw delivered the fourth such report to Mermam Farms to cover the next five years.

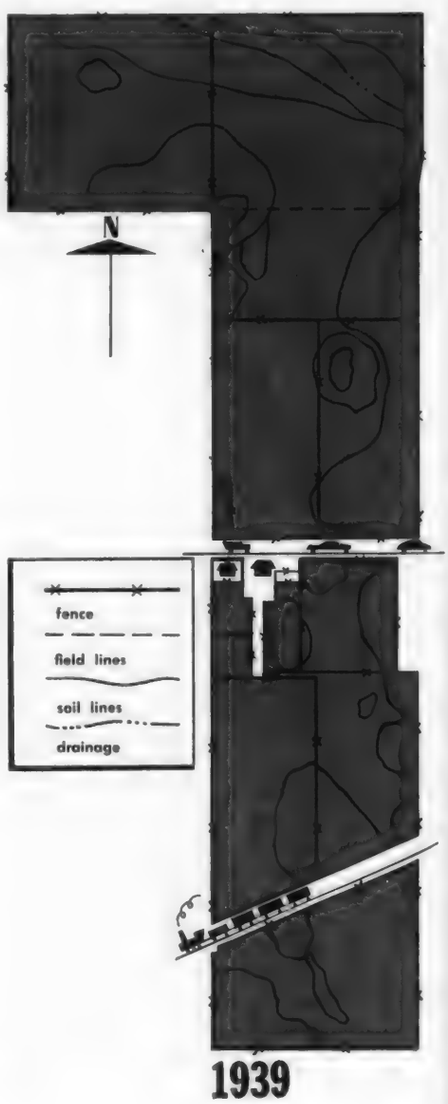
On the cover of the first report was the statement, "The only way you can possibly get back the money you have put into this service is to use the plans outlined." Henderson used the plans all right: but his copies are filled with notes, questions, and even an occasional exclamation point, for he has not followed the plan slavishly. Alfred Henderson is one of six owners of Mermam Farms. Mermam comes from the initials of the first names of his wife, brother-in-law, Russel Smith, sister-in-law, and two nephews. However, he is the manager of the farms and he is not delegating any of his responsibilities. That's the way Henderson operates and that is the way he uses the plans. He was dubious about changing from heavy cattle to the calves on grass plan, for example. He finally convinced himself by raising a batch of each one year, and comparing the profit and the risk involved in each method. That year, a fair to average one for heavy cattle, convinced him that there was both safety and profit in the calf plan. He has, however, steadily resisted buying over 100 calves a year though the Farm Clinic urges him to go ahead on the basis of his ability to produce forage. He has also resisted any effort to get him to change his methods of hog raising.

Long once said, "Alfred, you are the worst hog man in America." And another friend said, "If Alfred Henderson felt like raising hogs in the living room, he'd *raise* them there." All of which amuses Henderson: 30 years of profitable hog raising, he feels, refutes Long's claim and as for raising hogs in the parlor—he does, literally. He once rented a tenant house on the place to a man who worked in town, and he very quickly repented the act. When he asked the man to leave, the latter refused. For many months this went on, and the renter stuck like the wall paper. Finally Henderson said, "Well, all right, but I hope that you'll be kind to the sows I'm moving in." Next day he began to move piggy sows into the kitchen. The tenant left, but Henderson decided the house might work out best for hogs and moved in more sows and still uses the house for an obstetrics ward.

Henderson made good and careful use of the fertilizer and lime maps. As a matter of fact, when the lime truck rolls over the fields the driver carries a lime map of the field showing where the most lime is needed. By speeding up and slowing down the truck and by avoiding some

(*Continued on page* 104)

HERE'S HOW



1939

very high
high
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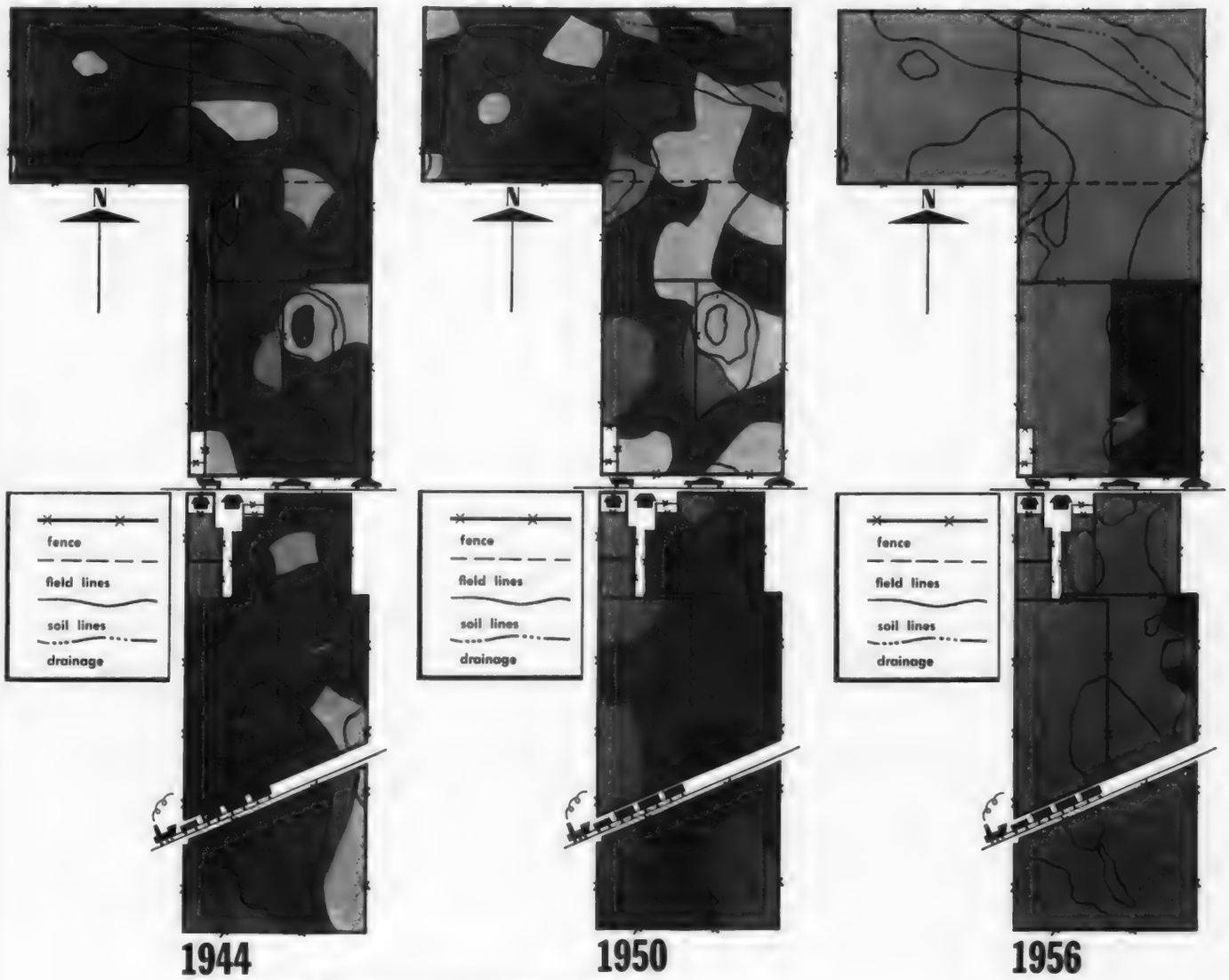
AVAILABLE PHOSPHORUS WAS INCREASED



1944 1950 1956

Here is one set of balance sheets in Henderson's account with his personal soil bank. There is a similar set for lime and potash. The last map shows that he could live off this stored wealth without adding fertilizer in case of a financial squeeze. Some of this added fertility came from fertilizer, some from crop residues.

THE FARM GIRL

BETTY SMOOTHED OUT her billowing petticoat in the traveling case just as the school bus began its backing turn in the barnyard. The lid of the case stopped a good three inches short of closing, the frothy folds refusing to be compressed.

"R-o-ger, please help me," she called across the hallway. "Roger!"

"All right, all right," groaned the approaching voice of her brother, "but I would feel a lot more like it if you were going on a 4-H trip. What gets me is the idea of hauling everyone all the way down to Daytona Beach so you can swim in May. Why, we'll be swimming at Dale Hollow in another month. And as far as I can figure out, all the farming ideas anyone will get will be learning how to plant the body in the sand on the beach."

"Sit here while I snap the fastners," answered Betty. "You're just mad because Susie's going. Maybe your Susie wouldn't have been so quick to accept if you hadn't raved so about the girl from Utah that you met at the 4-H Congress in Chicago. Mom says you are going to water my cabbage plants in the greenhouse, and feed my pullets, and wash up the separator at night after milking. You men will find out how it is to live in a house without girls. It was very nice of Mr. Hance to ask Mom to come along and chaperon the gang."

Betty paused for breath, then continued, "If you will remember, I picked blackberries and baked pies for the fair last year to help raise the money for this trip. And there are four of those pies in the freezer that Dad had to buy back; you can eat them while we're gone. You said that jiggers never bothered farm girls when we went out to pick the blackberries that day. I bet those bites still show when I get in my bathing suit.

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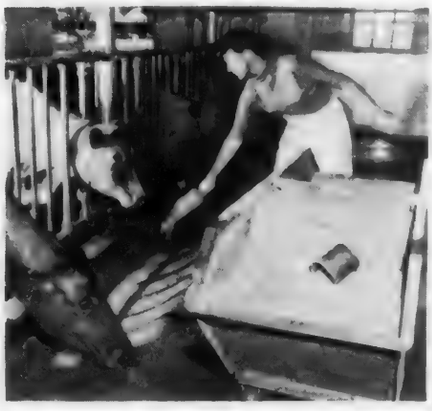


Can you pick out the farm girls and boys in the beach scene above? They all are! The Dean of Admissions at a Midwestern college sums up the 1957 farm girl like this: "You can't tell the farm girls from the city girls by their dress or by talking to them. But, oh, that difference. The farm girl can cook, and milk a cow, and make her own clothes, and drive a tractor."

TORNADOES

Tornadoes can not be prevented, but lives and property can be saved by preparing for them. Weather Bureau special forecasts give advance warning to danger areas

By Chester Charles

UNTIL LAST SPRING Wesley Walker considered a tornado something that happened to other people. His 1300 acres lie near Dodge City, Kansas, far from the tornado belt that spreads across the eastern part of the state.

Walker had reason to feel content. He and his three sons operated a partnership that comprised three going farms. A breeding herd of 400 Polled Herefords was putting them on top and extending their reputation. Bulls had been sold as far away as Louisiana and California. His sons were workers; the land was safe in their hands. Now there was more time to enjoy life, to hop across the country in the family airplane, buying and selling cattle, or just looking around. The grandchildren would all be farm reared. It was good.

That afternoon a year ago was too muggy for spring. The cattle were listless. Wesley was tinkering with a pump in the kitchen. Mrs. Walker felt beads of perspiration on her forehead as she went about her cleaning. The sky was threatening. The weatherman predicted storms.

Mrs. Walker was shaking a rug out the back door when she saw it. There was a great blackness tinged with green in the sky to the southwest toward New Mexico. She hurried to tell Wesley. He took one quick look. He had never seen a tornado, but he knew a bad storm when he saw one coming. He was not anxious to find out much about this one, up close. He and his wife grabbed the grandchildren and made a break for the storm cave.

The wind whipped. It was dark in the cave. The flashlight was weak and the children were frightened, whimpering. Hail began to beat on the cave door. Quietly, then insistently, a buzzing arose, first like an upturned beehive, then louder like a passing freight train. The cave door jerked, as if the wind were sucking it off its hinges. Then there was a thumping on the storm door and above the noise, Wesley heard his son's voice. He threw the latch and was almost catapulted out the door. His son and daughter-in-law had just made it home.

In the flat, open plains of the southwest tornadoes (left) can be seen approaching for many miles, and there is time to run for the cyclone cellar. In thickly populated regions and hilly country they often strike without warning.

For the brief span that the cave door was open, Wesley Walker glimpsed a tornado too close for comfort.

A great, black cloud billowed and rolled overhead. Not one, but a number of tornado funnels appeared. "There were eight or ten of those funnels that shot down. First there was a sort of white tail hanging from the cloud and racing across the fields, maybe a quarter mile away. It danced off from the ground, dangling for a second and then hop-skipped-and-jumped along. Then more tails, black ones, hatched out of that cloud all around us, sprouting downward. I had seen enough. I wanted that storm door between that storm and my family. My son and I had all we could do to get the door closed.

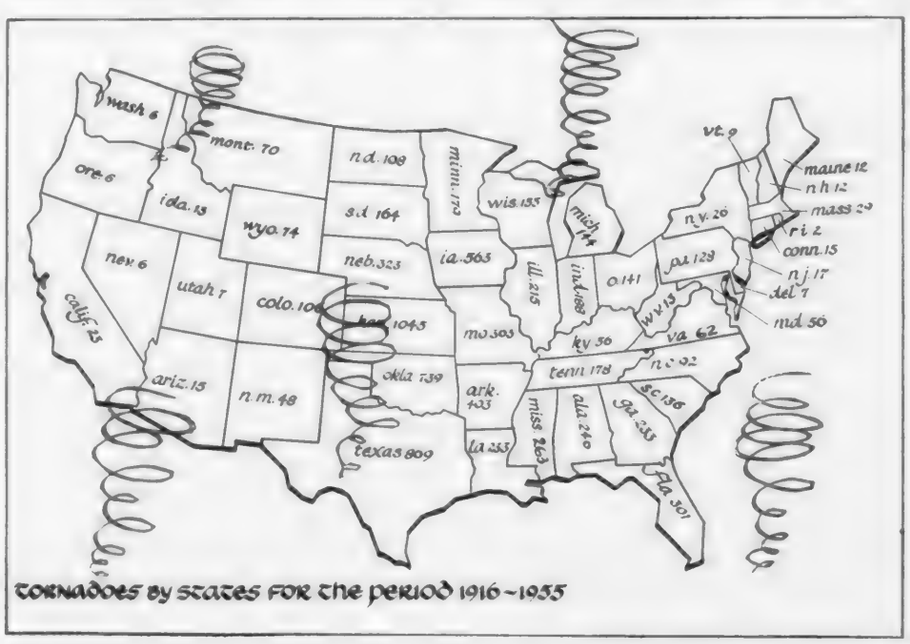
"The roar was terrific. We were all too scared to talk, except the kids, and you only knew they were screaming by their open mouths in the beam of the flashlight. In a few seconds, the roar passed. The rain kept beating, bad. We waited until the rain let up before we looked out again. The skies were clearing and nothing much looked amiss. Every building stood."

Half a mile away, nothing stood. Twelve farms had been leveled. Buildings on two of the Walker farms were beaten to the ground. Mud and water had been thrown everywhere. What had been homes and barns, equipment and livestock were reduced to debris, rubble, scattered flesh. "One of our favorite beef cows was still kicking under some wreckage. Half a dozen planks had been driven right through her," Walker recalls. "The tornado had come and gone in not much over 30 seconds. In those 30 seconds, over $50,000 in damage had been done to our two farms. Thank God my family was spared. The tornado left a swath of destruction only about an eighth of a mile wide. It spinned on the ground for some 15 miles, then just faded away."

It Can Happen to You

No matter where you live, the chances of your being hit by a tornado are slim, but there is no absolute immunity anywhere. The chances of escaping without serious loss if you are in the midst of a tornado are even slimmer.

Tornadoes occur in every state. In more recent years, Chicago has had 6;



TORNADOES BY STATES FOR THE PERIOD 1916–1955

When a tornado threatens, a storm cellar, called a "scare hole" in Texas, is the safest place for the family, the dog, and as much livestock as you can crowd into the place. Storm cellars are standard equipment on many plains states farms.

Washington, D. C., 4; Cincinnati, 8. The entire town of Coatesville, Indiana, was wiped out in 1948.

Think of tornadoes and you think of Kansas. In frequency, Kansas rates are highest. But that is not the whole story. By relative size, Iowa has more tornadoes than any state in the Union. Kansas, Oklahoma, Arkansas, and Mississippi follow in that order. In a 34-year period, more people were killed by tornadoes in Illinois than in Kansas and Oklahoma combined. Pennsylvania deaths are little short of those of Iowa. Property damage has been greatest in Oklahoma and Illinois, with Ohio and Indiana high on the list. Dense populations and lack of visibility are largely accountable. In tornado country, people stand prepared; the land is flat and open and tornadoes can be seen in time to run for safety.

Why Worry?

In view of tornado statistics, an alarmist attitude is not justified. However, wind and storm damage is a hard thing to avoid in a lifetime of farming. Tornado precautions are quite like storm precautions, and to anyone living on a farm, being set to withstand weather is part of the job. Being ready is not expensive; it involves no more than an awareness of danger, a simple refuge for protection and the use of sound methods of building construction.

You may never be on the short end of the statistical stick, like Wesley Walker. But the big wind can get you if you don't watch out and a tornado is just that, a big wind, a special kind of big wind.

First, examine what a tornado is NOT. It is not a dust devil, nor do dust devils ever develop into tornadoes. These swirling winds of dust happen mostly on hot, bright, windless days. They start at ground level and whirl upward, while tornadoes start in a cloud and reach downward, though the spiraling within a tornado is upward. A hurricane is something else again. Hurricanes are violent whirling storms, starting over water in the tropics, lashing inland for the most part from our southeastern coast line. They whirl counter-clockwise, at up to 150 mile winds, with the highest speed just beyond a fairly calm eye in the center. In ground travel, they average 12 miles an hour. Hurricanes last one to four weeks, ordinarily moving north, covering up to 10,000 miles, and are always accompanied by torrential rains, with the greatest number of deaths by drowning and the largest property damage from water. In the western Pacific they are called typhoons. Along the Mexican and southern California coast they are called hurricanes.

In popular usage, the term "cyclone" is misleading. Technically, a cyclone is merely a low pressure area surrounded by turbulence. Hurricanes, tornadoes, and a lot of other weather situations, not necessarily at all severe, fill the bill as cyclones. Of all bad weather conditions, none are as fierce as tornadoes. They lack the scope of hurricanes, but for on-the-spot destruction, for instantaneous, terrifying, world-changing violence, the tornado can only be compared with the hydrogen bomb.

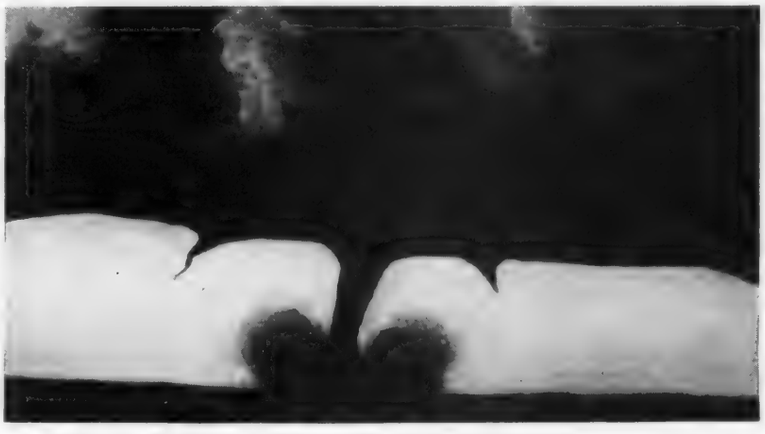
Near Gridley, Kansas, they arrive fast. One evening last summer, young Harvey Raaf and his brand-new wife were uneasy. They heard the general severe storm warning over the TV, so they got the cows in early for the night milking. Rain fell in torrents against the milk room windows. A puddle edged under the door. The lights went out, then the roar began. Harvey pushed his wife out of the milkroom into the downpour. He picked her up from the mud twice before they made it to the fruit cellar, across the barnlot. The roar increased, then passed overhead in

(*Continued on page* 121)

Clouds which seem to hang up side down—meteorologists call them "mammatocumulus" —nearly always occur in the vicinity of tornadoes, though often they are a warning of hailstorms as well. There is no damage until a funnel spirals down from the parent cloud to the ground. The funnel at the right travelled along the ground for 12 miles, ending near Manhattan, Kansas. The tornado below developed a series of funnels, which hopped, skipped and jumped across the ground.

The tornado below was photographed 2½ miles away as it approached across open country. Even at that distance, a tornado is an awesome and fearful spectacle. The noise adds to the terror. This was photographed 2 miles south of Mitchell, Nebraska.

This is believed to be the oldest photograph of a tornado in existence. It was taken in 1884 in South Dakota by an unknown photographer. It has triple funnels, two of which are just forming. The roaring center is cutting a quarter mile swath.



FERTILIZER-INSECTICIDE MIXTURES

For $1.25 an acre a farmer can add insecticide to his starter fertilizer to insure his corn against rootworm damage Lodging is less and yields have been raised 10 to 30 percent.

By Fred Knoop

"One for the maggot
One for the crow
One for the cutworm
And one to grow."

THIS WAS THE ADVICE the pioneer farmer gave his son on how much corn seed to plant. Up to now farm techniques haven't made this doggerel completely out-of-date. But the situation is changing fast.

One Iowa farmer, Howard Waters of Danville, decided he had been raising too much 50-bushel corn on 80-bushel land. Five years ago this Spring he called on the research men at Iowa State College at Ames to see whether his problem was the corn seed, the way he fertilized his corn, or the wrong sign of the moon when he planted it.

"None of these," said J. H. Lilly and Harold Gunderson of the College, and they set to work with spades, sifting screens and knives. As they had suspected, they found the soil was loaded with rootworms. One of Howard Waters' big cornfields became a battlefield that summer, the bugs and worms lined up against modern chemicals. The insect and worm army ended the battle in as disasterous a rout as Napoleon met at Waterloo. All the known effective insecticides were used. Aldrin, heptachlor, BHC (benzene hexachloride) and endrin were applied as liquids, broadcast with a sprayer, and immediately disked in (within the hour). The application was made about a week before plowing at the rate of 1 pound of each chemical to its acre. Check plots, 6 rows wide, were left in between the areas of chemical treatment of the soil. Just how effective the chemicals were in killing off the underground corn destroyers can be seen in the photographs on page 57. When the untreated check rows were harvested (by hand), they yielded 50 bushels to the acre. The areas that had been treated yielded just under 100 bushels to the acre. The second year after the treatment the difference wasn't as great but it still showed about 25 bushels more to the acre on the treated areas. In the third year the plants in the treated areas stood up and grew better. Lodging in corn that year wasn't as great because it was a dry year.

Moving over to Missouri, we can look in on Jim Bennett of Bollinger County and see how he put corn-raising know-how together with a fertilizer-insecticide mixture to set a record for his county—196.7 bushels of corn to the acre.

To get this high yield, 150 pounds of nitrogen, 100 pounds of phosphate, and 100 pounds of potash were plowed down. At planting time, 125 pounds of 12-12-12 were added to the row as a starter fer-

tilizer. Aldrin was used in the starter fertilizer to control rootworms.

Bennett planted the corn on June 1, 2, and 3; it was US 523 W hybrid seed planted at a rate to produce 18,000 stalks an acre. The corn was cultivated twice with a rotary hoe and twice with a standard two-row cultivator.

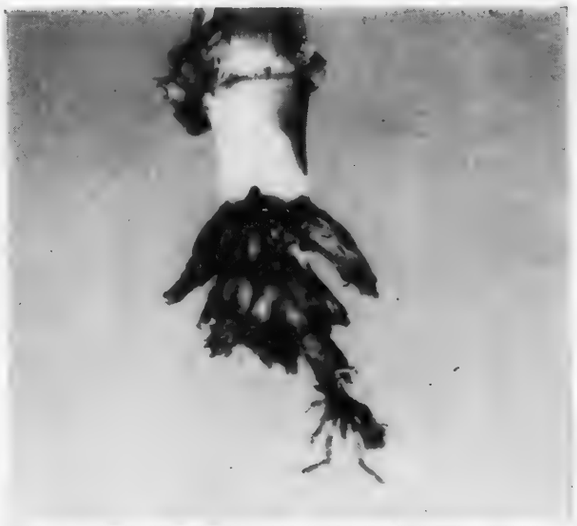
The corn was first irrigated, with five inches of water, when it came out in tassel. Two other five-inch irrigations followed, giving the field approximately 96,000 gallons of water per acre in the three irrigations.

Harvesting the high yield was some trouble, of the profitable sort, but with a one-row picker and a two-plow tractor Bennett managed to fill a 40-bushel wagon in 20 minutes. He picked 500 bushels in seven hours for his best day's run.

Costs of growing the big yield ran 47 cents a bushel. Bennett had $93 an acre invested in the crop—$32 of it in fertilizer and the remaining $61 on extra labor, gas, oil, depreciation on equipment, and other expenses. In Missouri, the average cost of producing 30-bushel corn without fertilizer is $28 an acre—or nearly $1 a bushel.

We've Always Had Soil Insects

Most farmers are familiar with cutworms and the damage they do. Tomatoes, cabbage, tobacco and corn stems are all mighty fine delicacies to the cutworms. The Cutworms and white grubs generally are worst following the plow-down of sod. White grubs simply eat away the root systems causing the plants to wilt and lodge or die. Sod webworms are often associated with cutworms in sod land and do similar damage. Corn rootworms destroy the roots, causing the plants to root-lodge during wind storms. If this happens while the corn is still growing, the plants develop a characteristic "gooseneck" shape.



A case of severe damage by corn rootworms is shown above. The lower roots of the corn have been pruned away by the worms. As often happens this was followed by decay.

Soybeans have their underground enemies too. These white grubs were growing fat on the roots of soybean plants. They can be controlled with insecticides.

The photo at the right shows Howard Waters' farm near Danville, Iowa, the year it was first used as a testing grounds for various kinds of soil insecticides. Notice how severe the rootworm damage was in the 6-row untreated strips in the field. The lodging was bad here and in some rows the corn roots were pruned off completely. The photo below was taken in one of the untreated strips. Alongside, where the insecticide had controlled the worms, the corn grew high and straight.

Thousands of acres of corn are replanted every year in the Corn Belt because of cutworm damage. Replanting is at best a costly operation. Often late planting brings corn along at a time when it catches the early frost and is severely damaged. Wireworms and seed corn beetles also destroy corn stands in some areas, often too late in the growth cycle for replanting to be successful. Added to these pests are seed-corn maggots which damage corn, soybeans, and other crops just about everywhere in the country. We are trying for bigger yields today and we are providing more and better food for the insects; that is why it may seem to some of the old-timers that bugs are more of a problem than they used to be.

Killing Corn Rootworms

Says Dr. J. H. Lilly, Research Etomologist at Iowa State, "Aldrin, heptachlor and BHC are the leading rootworm insecticides. All are highly effective at low dosages, and are reasonable in cost. Aldrin is widely used at present, although BHC was the first to be found effective for this purpose. Dieldrin, endrin, isodrin, and chlordane have all been used successfully. DDT is not effective.

"The successful methods of applying soil insecticides for rootworm control on corn are as follows:

"1. Use of starter fertilizer planter attachment for applying insecticide-fertilizer mixtures in place of ordinary starter fertilizer. No extra operations are involved. Now that these mixtures are becoming commercially available in most parts of the country, you buy them bagged just like fertilizer. Low dosage levels are adequate because the insecticide is placed and concentrated in the root zone where rootworms and other stand-reducing insects do their greatest damage. This is an economical method of handling the material because you are not covering the whole field.

"2. You can use planter-mounted sprayers which are designed to spray an insecticide mixture in a narrow band just behind the planter shoe at the time of planting. They do a good job of putting a prescribed dosage of chemical right where it will do the most good. Their cost is nominal ($60 to $150 depending on how much of the installation work you do yourself) and they give good service.

"3. Broadcast spraying can be done, using insecticides in the emulsion form in low-gallonage applications, and disking or plowing soon after applying to incorporate the insecticide into the soil. Excellent results are obtained with low-pressure spraying equipment.

"4. Broadcast application of insecticide-fertilizer mixtures of granular insecticides will accomplish the same result as broadcast spraying, provided the insecticide is properly worked into the soil. Broadcast applications of either dry or liquid material is slightly more expensive because you have to use more of it. On the positive side you do get more carry-over effect.

"For the present, BHC is recommended only for broadcast applications."

Liquid Fertilizers

The liquid use of the insecticides is practical in combination with liquid fertilizer for starter fertilizer side dressing by applicators or band sprayers. You will want to use approximately 1 pound of insecticide to the acre. Emulsifiable forms of aldrin and heptachlor are sold in a concentrate of 2 pounds of chemical to the gallon and 4 pounds to the gallon. If your sprayer is set for applying 5 gallons to the acre then you will want to add ½ gallon of the 2 pound per gallon concentrate to your mixture for each acre of capacity you have in your tank. This year special insecticides will be available with an emulsifier incorporated in them that makes possible mixing with the complete NPK liquid fertilizers. Special emulsifiers that make possible this mixing are manufactured by the Emulsol Chemical

(*Continued on page* 118)

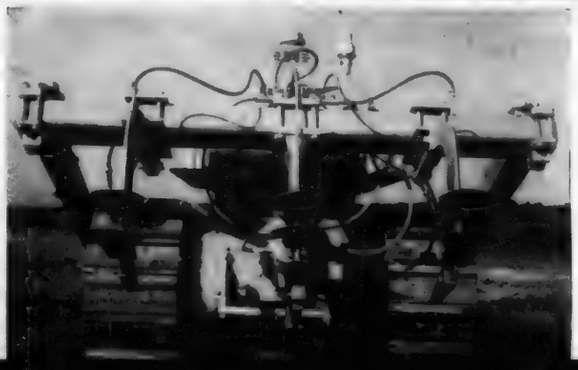
Here are some of the ways to put Fertilizer-Insecticides to work

In the trip over the field shown above, the farmer is broadcasting a fertilizer-insecticide mixture with a Century spreader and working it in with the disk. This is a fast once-over treatment that controls soil insects.

Fertilizer-insecticide mixtures can be applied efficiently as starter side-dressing at planting time. The big capacity of the new Burch planter makes it ideal for this work.

Below, the four-row corn planter is equipped with Gandy insecticide attachments. The amount can be varied and is placed right in the planting band.

Insecticide has been mixed with liquid fertilizer and is being broadcast before disking with this big truck sprayer.



This bazooka-type applicator for liquid fertilizer treats several depths and was built by the Fabic Bros. Equipment Co. of Sikeston, Mo. for a Cat D-4. The tractor carries a large supply tank, which can be used for liquid fertilizer-insecticide mixtures.

This handsome fellow has a showy paint job, but he is bad news in the garden. He is the Striped Blister Beetle (*Epicauta vittata*). Dieldrin can control him in foliage and aldrin in the soil.

Super-sized Feed Lot

By Charles R. Koch

Tovrea customers concentrate their capital in feed and cattle. They cash in on the efficiency of a large scale contract feeder

ONE NIGHT LAST FALL a pair of travel weary airmen approached the Phoenix Airport in their light plane. The runway light pattern seemed rather odd but there was plenty of space, so the pilot brought his plane down in routine fashion. Just before he touched ground he got the shock of his life. In the beam of his landing light stood a bunch of spraddle-legged, thoroughly spooked cattle; and less than 100 yards ahead was a fence. He put the plane down, scattered cattle right and left, cut his engine and he and his companion climbed unharmed from the wreckage after an abrupt meeting with the fence.

That was an unorthodox introduction to the Tovrea Land and Cattle Company, but then there's nothing orthodox about the Tovrea operation.

Back in the corn belt a cattle feeder is a man who buys a carload or two of cattle every fall, puts them in a lot, pours his corn crop to them for upwards of 90 days, and hopes to cash in when he sells them. He has a one-shot operation.

Here at Tovrea's a feeder owns a bunch of cattle, but no land or crops. His only investment is in the cattle, which he sends over to the Tovrea feed lots. This organization supplies the feed and does the work. They can handle as many as 35,000 head of cattle at a time; they run as many as 290,000 through the lots in the course of a year. And 17 men in the yards do the entire job. Twenty-five years ago there were 100 men on the payroll feeding fewer cattle. This is automation in the feed lot; all the lifting, loading, grinding, mixing and feeding is done by machinery.

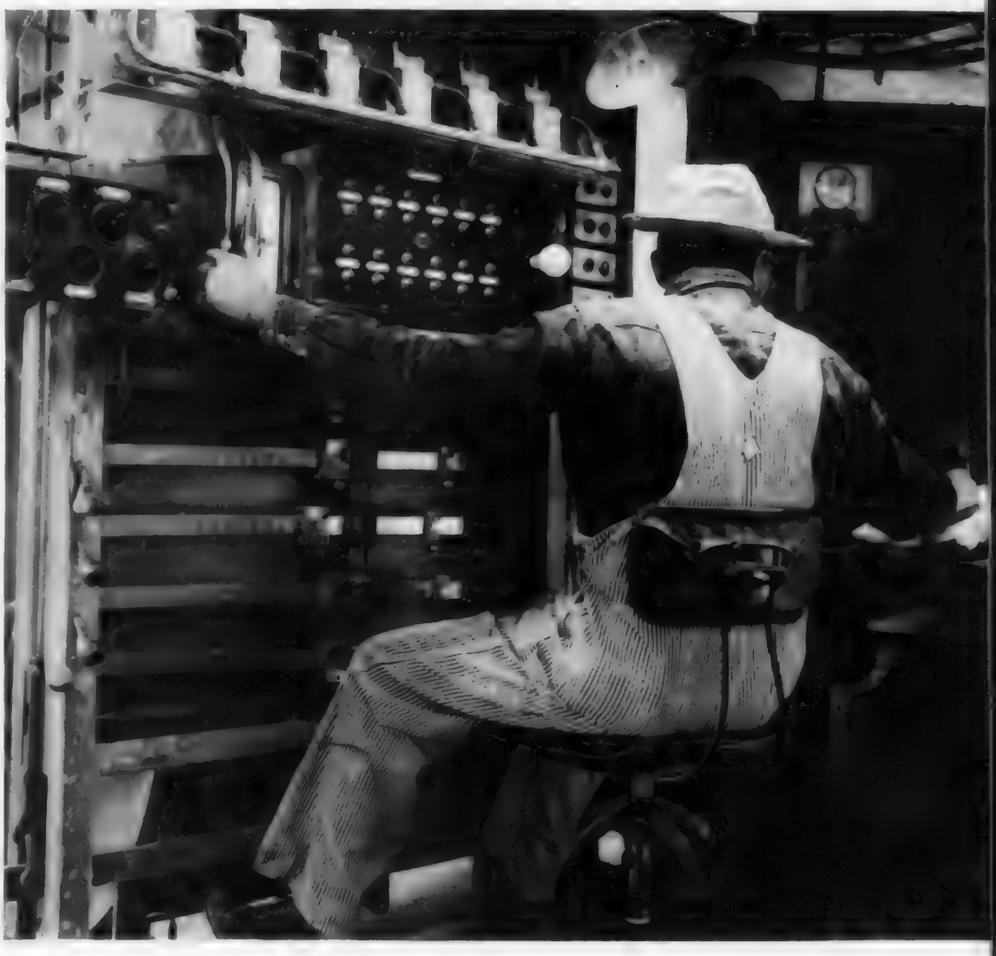
The figures on the feed and accessories of the Tovrea organization read like the spiel of a Ringling Bros. barker. The yards cover 175 acres and are divided into 396 pens which are enclosed by 12 miles of fencing. The fences contain 380,000 board feet of lumber and are supported by some 13,000 posts. Three hundred and thirty thousand gallons of water circulate daily through the 50,000 feet of pipe.

Total annual feed consumption is 82,000 tons with a value of $4,000,000. This feed bill is broken down into 27,000 tons of hay; 26,000 tons of grain, mostly milo and barley; 6,000 tons of molasses; 15,000 tons of cottonseed hulls; and 8,000 tons of cottonseed meal.

Daily feed consumption with a population of 30,000 head of cattle in the yards is equal to the entire annual production of 240 high yielding acres.

The operation centers around a strikingly modern office building complete with a tile lobby, drug store, a handsome restaurant, Cattleman's Club, and the Bar 1889 which combines all the traditions of the old west with the refinements of the new. This nerve center squats in splendor on the edge of a bright green lawn—the only green for miles around—spiked here and there with towering palm trees and bordered with neatly kept beds of the most colorful flowers of the Southwest.

Thirty-five tons of feed an hour are delivered to the hoppers (right), above the scale house. From the hoppers it is fed by gravity into the self-loading trucks which deliver it to all parts of the yards. Harvey Lazenby, a Tovrea veteran (below), handles the switches and levers which control the grinding and mixing operations. Seventy per cent of the cattle fed in the yards (opposite page) belong to outsiders. These yards have a capacity of 35,000 head at one time, as many as 290,000 a year.



Across the road from the office building, perched in gaudy dignity on the brow of a hillock and guarded by a bristling army of Saguaro cactus and prickly pear, is the Tovrea castle, a three-story, yellow pyramid built by the patriarch of the Tovrea clan who came to these parts in 1882.

Custom feeding of cattle is not unusual in the Southwest. In the Phoenix telephone directory alone 21 such operations are listed. Population increase in this area and on the west coast has been phenomenal since World War II and cattle feeding has moved right along with it. Eight years ago there were about 400 feed lots in Arizona and California. Today there are over 1200. The Tovrea operation is among the oldest and the largest. Western Cattle Feeders at Blythe and Puente, California, have been in business since 1906 and can handle 65,000 head of cattle at a time in their two lots.

The Tovreas, like most other custom operators, are primarily in the feed business. "The prime object of the whole setup, so far as we are concerned, is to sell

feed," says Ed Tovrea, grandson of the ex-freighter who put together an empire which now includes five ranches besides the various enterprises centered around the Phoenix yards. Ed ably carries out the theme of the unusual in the organization. As general manager of the yards he directs the activities of a multi-million dollar business. Yet this slim, youthful, almost collegiate looking scion of the Tovrea clan wears his responsibilities so well one can hardly believe that he is boss of the outfit until one sees the calm authority with which he handles the operation.

Selling feed was not the original reason for setting up the yards. About a half mile down the road from the Tovrea headquarters stands a Cudahay Packing plant. This plant, too, once bore the Tovrea name. It was built in 1929 and some eight or nine years later the Tovreas set up a feed yard adjacent to it. They moved their cattle from the ranch to the yard, finished them off on a little grain, and put them through the plant. As time went on the yards expanded, stimulated, of course, by the high beef prices of the post war period. After the packing plant was sold in 1946, the Tovreas found themselves with a huge yard and feed mills. The problem was to keep it operating as close to capacity as possible. Even the far flung Tovrea ranches could not turn out enough cattle to fill this quota, so, being in the heart of the agriculturally rich Salt River Valley, the Tovreas took the logical step. They went into the feed business in a big way and opened their pens to cattle consigned by outside feeders.

Cattle numbers in the yard fluctuate in relation to the feed-cattle ratio. When feed is high in relation to the price of finished beef, numbers slump. As the prospects

Dr. Frank Olvey (kneeling, above) treats a sick calf with the assistance of one of the yard's cowboys. This daily routine holds death loss to a mere ¼ of one percent. Bossman Ed Tovrea (right, below) discusses cattle prospects with Jim Wilson, a buyer for Armour and Company. Indiana-reared Dewey Norris (left), Ed Torvea's right hand man, runs a precision operation on an easy-going, low blood pressure schedule.

improve the lots begin to fill. Formerly, there was a wide seasonal fluctuation in numbers with as few as 2,000 head in the yards in summer and a capacity crowd of 30,000 to 35,000 in the fall. This seasonality has now been stabilized by a steady year-round demand for beef in the area served by the yards, and numbers now seldom fall below 10,000 at one time.

A walk through the Tovrea yards is almost like a visit to a bovine zoo. Here one can see cattle of all breeds, grades, size, age and sex. They are in pens averaging a half acre or so in size with sun shades running down the center. The shades are made of slatted material like snow fencing strung between poles. There may be anywhere from 50 to 300 cattle in a pen. Feed bunks extend along the alley side of the pens and each enclosure has its own water supply.

Bulls and cows, of course, are least in evidence. But even so, there are always a few; perhaps a couple of Charolaise bulls, a few rangy Brahman cows. Then there will be pen after pen of steers and heifers, thousands of Brahman crossbreds, Hereford, Angus, Shorthorns, Holsteins, a great variety of dairy-crosses. The whitefaces and the Brahman cross predominate.

Weights will range from 200 pound calves up to beef ready for the market at the Southwest's most popular weight, 900 pounds. You won't find any 1200 and 1300 cattle here, nor will you see any prime animals. "It doesn't pay," is Ed Tovrea's simple explanation for their absence. Whitefaces may be carried to a choice grade, Brahman and Brahman crosses are usually finished as good.

The most ubiquitous class of cattle found in the yards is a kind unknown in the east—pen-fed veal. These, too, are predominantly crossbreds bought right off their mothers at 200 to 250 pounds and fed to 400 to 450 pounds, sometimes even to 500 pounds, and slaughtered for veal. They always make up a high proportion of the cattle in the yard, running anywhere from 40 to 60 percent of the totals. Early last November, for example, 7,000 of the 19,000 cattle in the yards were vealers.

They get no milk, only the same basic grain ration which is fed to the larger steers and heifers. Last fall they could be bought for 12 to 14 cents a pound and were bringing around 18 cents as finished veal. The Tovrea ration puts a gain on them of about 1.8 pounds a day at a cost of 17 to 18 cents a pound.

"Week in and week out, right around the calendar, veal is about the most consistent money maker we have here," says Dewey Norris, Indiana-raised foreman and right-hand man to Ed Tovrea. A little arithmetic shows he is not far wrong as long as prices hold around these levels.

A 250 pound calf at 14 cents costs $35. At 18 cents a pound it costs $27 to put a 150 pound gain on him. If he sells for 18 cents he grosses $72 which leaves a net of $10 a head after deducting the purchase price and feed costs—a thousand head, $10,000 profit. But those prices have a way of changing fast.

Most of this veal moves to California markets. Denver, according to Norris, uses some of it and Fort Worth is beginning to develop a taste for it.

The only fee charged by Tovrea is the price of the feed. Included in this price is all yardage and service charges. If any veterinary services are needed Dr. Frank Olvey or his assistants, Dr. Bruce Farquharson or Dr. L. T. Walker, do the work and the owner of the cattle is billed. The Tovrea Company assumes liability for all negligence other than ordinary handling losses.

The owner has a choice of four or five different rations, the prices of which are subject to change whenever there is a change in feed prices. One of these rations which is heavy on roughage is used as a holding feed or a warm-up for thin cattle. The others contain more grain and protein supplements and are the fattening rations. Typical rations and their prices as of November 10, 1956 were:

Ration No. 1	$49.75 per ton	
Grain		48%
Cottonseed Meal		11
Molasses		10
Hulls		12
Hay		22
Ration No. 3	$48.50 per ton	
Grain		40%
Cottonseed Meal		6
Molasses		10
Hulls		12
Hay		32
Ration No. 7	$46.75 per ton	
Grain		32%
Cottonseed Meal		5
Molasses		10
Hulls		12
Hay		41
Ration No. 20	$41.00 per ton	
Grain		13%
Cottonseed Meal		4
Molasses		10
Hulls		25
Hay		48

(*Continued on page* 136)

Pen fed veal is a specialty of the Tovrea yards. Two hundred to 250 pound calves, mostly Brahman crosses, are fed to 400 to 450 pound weights on a grain ration. They find a ready market in Los Angeles, Phoenix, and other Southwest buying centers.

FARMERS OF THE UNITED STATES!

DRILL YOUR WHEAT, AND

SAVE IN ONE YEAR $27,000,000!

Late experiments in this country, together with many years' experience in England, prove beyond the possibility of a doubt, that Wheat, planted in drills 9 or 9 inches apart, will produce from 8 to 10 bushels more to the acre, than when sown broadcast, the usual way. Dr. NOBLE, of Delaware, has proved the relative advantages of planting Wheat in drills 9 inches apart, and sowing it broadcast, the usual way. The soil and treatment, in other respects, were precisely alike. The result was 24 bushels on the sown land, and 34 on the drilled. These experiments were made on fields of same acres."

Cheapness of production, by Economy of Time & Labor,

should be the object of every intelligent farmer.

Among the many improvements which tend to diminish the labor & cost required in raising Wheat, —the great Northern staple, which is the life-spring of the South, & prosperity of the North—none excels

GATLING'S SEED PLANTING HARROW,

Which performs the triple work of Harrowing, Sowing and Covering at the same moment. Thereby saving much time and labor to the Agriculturist. It will, no doubt, be the means of entirely changing the mode of planting Wheat in this country, as its economy of Grain, Ground, and Time, will every where recommend it in the place of broadcast. The Machines have been in use two seasons and wherever introduced, they have given entire satisfaction.

About 150 millions of bushels of Wheat are supposed to be the average crop, raised in the United States, which is estimated to be grown on 12 millions of acres. If by drilling, as only three bushels more can be raised to an acre, (which is a low estimate,) the crop in the United States would be increased 36 millions of bushels, which, at 75 cents per bushel, would amount to $27,000,000, as not seeding to the farmers, as no additional cost in capital or labor, would be required. In addition to the above, a saving of one peck of seed to each acre, may be made by using the machine. This alone would be a saving to the farmers, in one year, of 3 millions of bushels of seed.

The saving is caused from the fact of the Machine's sowing the seed with great regularity and precision, and covering it all the seed a good and proper depth.

When Wheat [illegible] always portion of the seed remains on the surface, [illegible] exposed to all the birds to pick up. In regard to depth of the seed sown in hot [illegible] Wheat planted in drills is greatly preserved from being thrown out in the frost. The [illegible] the frost affects the drills by spring, and nourishes the growing plants.

The Machine is simple and strong in its construction, easy to be managed, and not liable to get out of repair. The whole [illegible] in a much better manner than is attainable by hand and with far more despatch.

E. J. GATLING, Patentee.

[illegible]

All About Grain Drills

One of the first Van Brunt Drills

A grain drill can save up to 1/3 the seed at planting time. At harvest time it can increase the yield up to 25 per cent. A modern drill can plant the grain, sow the grass seed, lay down the fertilizer and press them into a firm seed-bed, handling up to 40 acres in one day.

By Russell H. Kerr

AMERICAN FARMERS have never liked to walk. It was logical enough that the field jobs that required the most walking got early attention from farmer-inventors and blacksmith shop toolmakers. The inventor of the Gatling gun, Richard J. Gatling, of North Carolina, made one of the first grain drills in the 1840's and called it a "seed-planting harrow."

The observant eyes of two Wisconsin brothers, Daniel and George Van Brunt, put them to work on our first practical and widely used American grain drill. They saw that grain-sowing farmers were not only doing considerable walking, but were literally feeding the birds. At that time, in 1859, we had tremendous flocks of wild pigeons in America. The appearance of farmers with broadcast seeders was a signal for the pigeons to descend on the field. They often cleaned up the seed as fast as it was sown. The Van Brunts designed and tried out a machine which had a force feed for regulating the sowing rate and a device to cover the seed with soil, secure from the sharp eyes of the birds.

Months of shop work coupled with field testing, to see how their seeder worked, gave them a practical machine and in 1860 the Van Brunts sold several machines from their Horicon, Wisconsin, shop. With the help of the pigeons, the brothers weakened the sales resistance of Wisconsin farmers, and in 1866, they sold 1300 machines. The grain drill became widely accepted throughout the Midwest within a few years. Grain sown in rows gave greater yields than broadcast planting, with a saving of time, seed, and walking.

The Modern Drill

A modern grain drill complete with hydraulic lift, fertilizer hopper, grass seeding attachment, and press wheels is a marvelous piece of farm equipment. A single 14-foot drill mounted on rubber tires, will seed up to 40 acres in a long day, and allow two hours down-time for loading seed and fertilizer. As it moves across the field, it has actually done four jobs: planted the grain at the right depth (1 to 4 inches), placed fertilizer in the farrow or above it, dropped grass seed in bands above the fertilizer on the top of the ground, covered it and firmed it with press wheels or covering chains.

A grain drill is expensive, a mighty good reason why a farmer should know what type is best for his soil, weather and crops. A farmer can get sound advice from his county agent, dealer or neighbor on what type of drills have worked out best in his area. An Illinois custom operator who does several thousand acres of custom work a year has this recommendation: "Take a couple of days off and talk to the best farmers in your county about grain drills. There is no substitute for field experience. Just because a single disk opener works well in the wheat country in Kansas is no reason why you want to use it in Illinois. There are new ideas to check, like these rubber press wheels, that have increased the stand of grain and legumes for our farmer customers; when they get 5 to 7 bushels more grain to the acre that pays for the planting. You'll spend $600 to $1000 for a new drill and it's worth the time it takes to find out all you can about drills before you buy one."

The Basic Parts

A basic grain drill consists of a tapered seed-box made of metal; the older ones were made of wood, but galvanized steel is the usual material today. Drills still come with steel wheels, but rubber tires are generally used. They allow the drill to be closer to the ground for easier, more accurate seeding. The rubber tires reduce the wear and vibration and allow faster field and transport speeds.

The grain feed is the heart of the drill. It is the device that forces the grain out of the seed-box and measures the amount. There are two basic types, the fluted feed and the double run feed. The preference of farmers in different parts of the country for one or the other of these feeds is not based on habit alone. The fluted feed is used for all kinds of grain seeds and is extremely accurate when used with cleaned seed. The amount of seed measured out for planting is determined by the speed with which the fluted feed is revolved and the width of the fluting exposed to the grain. By merely shifting one or two levers two to three hundred different quantities of seed can be set on a modern drill with adjustable fluted feeds.

This cut-away end of a grain drill shows, left to right: the grass seed attachment, the grain hopper with fluted feeds, the fertilizer hopper with star-shaped feeds. The lids are spring loaded to keep them open or tightly closed.

The Double Run Feed

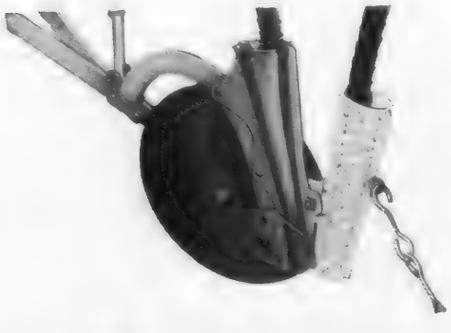
The double run feed has two outlets. One side is used for large seeds and large quantities, the other side for smaller grains and smaller quantities. Cut-off lids permit the use of either side alone. There are gate adjustments on each outlet to change the quantity of seed, and speed adjustments give further variation in the quantity of seed. As many as 200 different quantities of seed can be set with drills using this type of feed. The double run feed is used extensively in the Southwest and other winter wheat areas where small quantities, 25 to 30 pounds to the acre are planted.

To get the seed from the feed to the soil a flexible tube is used. Formerly, a ribbon type of steel tube was standard equipment. These do rust, particularly if high analysis fertilizer is being applied with the drill, and plastic and rubber tubes are available and are now widely used. These require little attention and the

A North Dakota farmer pulls his plow press drill "train" across the early spring horizon. This new-type drill is attached by a special hitch bar in back of the plow. As the soil is turned by the plow the pulverizer-packer smoothes and breaks it up before the drill rides over it. Following the drill are the press wheels. In a matter of seconds the soil is opened and closed behind the seed. Moisture loss by evaporation is cut down; the job is fast because everything is done with one operation. The drill can be fitted with fertilizer and grass attachments.

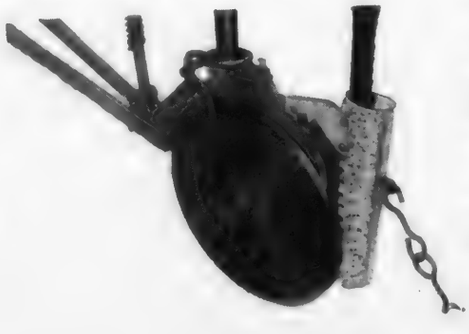
In Montana, where a wheat field stretches as far as the eye can see, multiple hitches are built to match the power of the tractor. Here are two D-6 Cats each pulling six Dempster drills and planting 15 acres an hour. These are deep-furrow drills with press wheels. The seed is planted four to six inches deep where there is moisture in the soil ; the ridges are thrown up to catch the winter snows. The press wheels firm the seed bed and prevent evaporation.

This big press drill is equipped with lister openers set in stagger rows. Its grain box holds two bushels to the foot and it also has grass seeding and fertilizer attachments. Notice that it rides on rubber-tired caster wheels in front and press wheels behind.



A single disk opener drops the grain directly in the spot of greatest cut. The fertilizer tube is back of the disk.

A double disk opener. Here a plastic tube extends down between the two disks to drop the grain seed. Fertilizer is banded directly back of the disks.



farmer is free of the rust problem. Both grain and fertilizer are dropped through a tube that leads directly from the box to the exact point of application. Separate tubes for fertilizer can be used to take the danger of corrosive fertilizer action away from the grain feed parts. Grass seed formerly was allowed to float out of the grass seed box on the front part of the drill. New model drills either place the grass seeding attachment on the back part of the drill where a tube can be led directly to the planting area in the top layer of the soil, or if the grass box is in front, a tube leads from it to the rear of the furrow openers where it can be placed in a shallow location after the grain seed and fertilizer have been given their deeper application. Band seeding attachments for grass seed planting put the seed in a very accurate and narrow band directly above the fertilizer. This greatly increases the germination of grass seed and gives a better stand with much less seed.

The Furrow Openers

There are several types of furrow openers which are interchangeable on most drills. Farmers in different parts of the country may prefer one type above all others because of the local soil conditions. The single-disk furrow opener uses a single-curved disk mounted on a spring-loaded bar (to maintain constant depth of penetration into the soil). This bar is usually made of double strap steel, spread, and attached to the drill frame at two points to maintain a constant line of draft for evenly spaced rows. The bearing on which the disk opener is mounted is usually a large, flat, chilled steel bearing. A new development to increase bearing life is a one-shot lubrication system which forces oil to all the bearings on the drill at the push of a plunger. There are also sealed bearings available; these use roller or taper bearings.

The Single Disk

The single-disk opener is usually 13 inches in diameter. It is used primarily where the ground is hard, where a mellow seed bed has not been prepared, or where it is necessary to penetrate through trash conditions. In the Southwest this furrow opener is used to cut through as much as 3 or 4 inches of loose soil and deposit the seed an inch or so into the moist soil beneath, for better germination. The single disk is the least expensive of the furrow openers and it does a good job in hard, rough soil conditions. It is also used in rocky soil in the Eastern part of the country.

The Double Disk

The double disk is an ideal opener for a well-prepared seed bed. It is a high-speed opener and will not throw loose soil the way a single disk does when operated at 4 or 5 miles an hour. Where deep placement is not important the double disk can be used in trash conditions. It can be set so that it will ride over the top of the trash and thus avoid clogging. The double disk is more expensive than the single disk, and is the farming perfectionist's type of opener. It makes beautiful, clearly defined and accurate rows.

The Shoe Opener

This opener has no bearing and looks like a minature sled runner. It is almost obsolete, but some areas of the South still call for it where they have corrosion trouble from high nitrogen fertilizers. The sealed bearing disk has largely eliminated this problem.

The Hoe Opener

The hoe opener looks like a cultivation shoe. It is used in the dry parts of the country, particularly in the Southwest. Many farmers use this opener interchangeably with disks, depending on the condition of the soil. The hoes are put on the drill when it is necessary to get down deep to reach into the moist soil. Hoes create a definite ridging in soil and are used for grain sorghums; every other feed opening is closed off to get wide spacing. Hoe openers are useful in rock and shale, as these openers are usually arranged with every other hoe staggered back 3-5 inches. This gives better clearance in a rough seed bed, and trash and rocks do not pile up in front of the hoes. There is also a special adjustable type of hoe drill called a "hoe shifter drill." The stagger of the hoes may be changed quickly on hoe shifter drills for adapting them to particular field conditions.

The Deep Furrow Opener

The moldboard deep furrow opener is used in the area of the Southwest and Northwest where deep planting and ridging is necessary, and is often used for grain sorghums to be planted in 14-inch rows. It is used with a big disk (usually 16 inch) and acts like a small plow; it enters the furrow cut by the disk and leaves a 3- or 4-inch flat bottom furrow. On most drills, the regular disk openers can be converted into deep furrow openers for use during part of the year.

The Lister Opener

The lister opener is available in a type of opener shoe which rides deep, throws wide furrows, and ridges the soil. The spacing between rows is 14 inches. The stagger is usually 20 or more inches. In the Northwest farmers will often use lister drills for stubble mulch farming. Lister drilling has the advantages of preventing seed blowing, soil drifting and frost killing.

(*Continued on page* 143)

The grain drill (above) is fitted with grass seeding tubes discharging back of the fertilizer tube ; chain coverers are shown here. To change this to band-seeding, the grass tubes should be moved to within ½ inch of the fertilizer tube and a gang of press wheels added to replace the chains.

The life of a drill is extended with these new plunger oilers that distribute oil to all the opener bearings on the drill.

The grassland drill, or pasture renovator, is a heavy duty machine capable of planting grain, fertilizing and seeding grass in a field that has not been plowed. The spacing between rows is usually about 11 inches. The machine can be used in a worn-out pasture, when the sod is dormant, to plant and fertilize for late fall or early spring grazing. Up to now it has been used in the South but it is working its way North, where it can greatly extend the pasture season.

Forest Pool

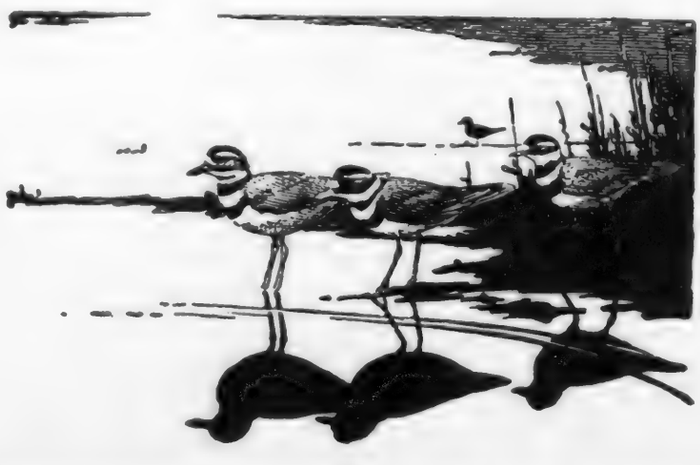
By SIGURD F. OLSON

A RING of spongy muskeg hemmed the pool, muskeg cut deep with game trails radiating from the water like the spokes of a wheel. Back of the muskeg was a rim of pointed spruce and beyond that a great wall of towering pines. The pool was the shining hub of the wheel, its black surface reflecting the protecting timber. The air was heavy with the redolence of sphagnum and resin. No sound but those of the wilderness had ever penetrated there. At the close of its long primeval period, the pool lay perfect and untouched.

A hundred years ago a white trapper from the settlements to the south followed one of the game trails that led to the pool. Trees were felled and he built a rough log shelter on the rise close to the edge of the muskeg, but even that did not change the quiet that had always reigned there. The nasal twang of the nuthatches still came from the pines, chickadees sang, and red squirrels leaped through the sunlit tops high above.

In the pines were marten, and in the swale not far away, beaver and otter. For many winters the trapper took his toll, and then the moose and caribou that used to come to the pool drifted to the north. The trap lines grew longer and longer, and one winter the trapper did not return. The cabin fell into decay, chinking dropped from between the logs, and at last the roof fell in. Pine needles and moss covered it, and after a time it became a mound of duff beneath the trees. Once more the moose and caribou came down the trails and the marten were back in the timber. The forest pool lay as before, smooth and dark in the shadows.

Then, one fall, timber-cruisers discovered the pool and the great stand of pines around it. They repaired the old cabin, rechinked the logs, replaced the roof. For months they worked, blazing long straight lines through the surrounding forest, laying out roadways and trails, cruising the timber. In the spring, when the campaign of destruction was complete, they left the pool and followed the trapper's trail toward the south.



It was September when the logging crews moved in with men and horses, mountains of equipment and supplies. They tethered their teams in the big timber around the pool. For days the woods resounded to the crash of falling trees, the shouts of men at work. Never for a moment were the axes silent or the crosscut saws. Log buildings rose where the trees had been, and for the first time the forest pool knew the glare of sunlight. Until the snow came, moose and caribou returned to their old watering-place and the hunters who supplied the long tables with food shot what they needed without stirring far from camp.

For two winters the loggers stayed, and then they moved on to new stands of timber in the north. For many years the pool lay stripped and ugly, and around it the slashings were barren of life. Only the rabbits remained and the coyotes that preyed upon them. At first the pool had as much water as before, but when the little streams and spring trickles disappeared, it began to shrink and the once-spongy muskeg around it became brittle and dry.

After a summer's drought came a violent storm. Lightning flashed and thunder rolled over the denuded hills. After the storm had passed, a tall dead snag crackled and blazed. When it crashed into a tangle of brush and tinder-dry pine tops, the slash exploded, and for weeks the entire countryside lay under a pall of smoke.

Mosses and lichens disappeared, and then came fireweed, jack pine, aspen, and birch. The water shrank still more in the old pool. Cattails and sphagnum encroached upon its edge from the surrounding muskeg and soon cov-

(Continued on page 94)

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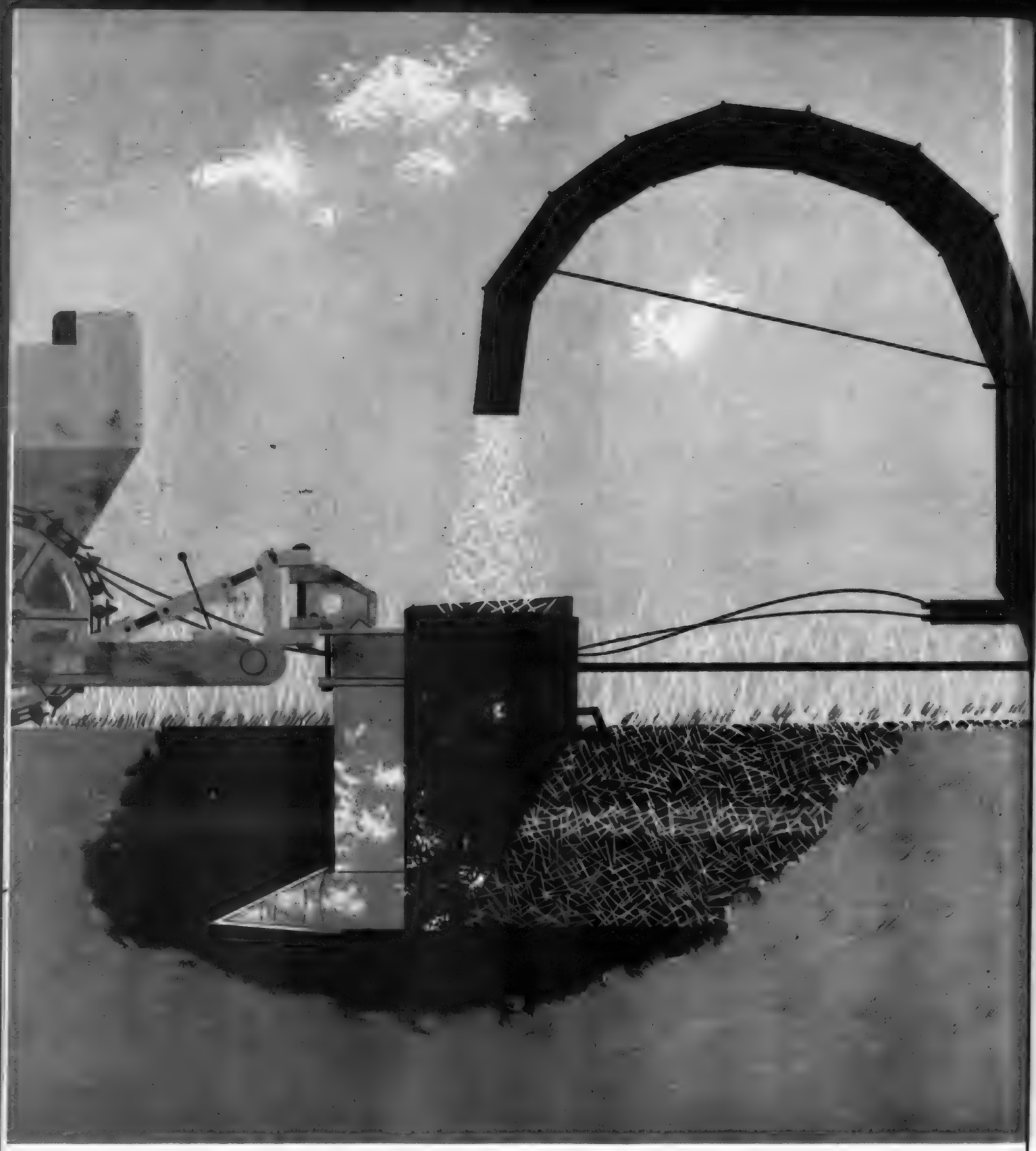


THIS IS A NEW TOOL FOR VERTICAL MULCHING

Deep tillage has been given a revolutionary new twist with the vertical mulching technique which opens a channel deep into the subsoil and stabilizes the channel with chopped straw, corn stalks, or other material blown into the cut. This cut-away drawing shows the deep tillage tool with wings which hold the soil open long enough to blow in the mulch. With a channel opened through the light colored hard-pan, both drainage and root penetration are permanently improved. The photographs opposite show the actual equipment used by Purdue in their experiment.

Vertical Mulching

Crop residue blown into a channel opened by a subsoiler holds it open for better surface drainage, aeration, and water storage.

WHEN JIM SPAIN sat down in the lecture hall at Purdue University to listen to still another paper on soils at the 1953 Winter Agricultural Conference, he hardly expected to be struck with an idea that may revolutionize our methods of subsoiling. Yet, before the hour was up, he had it—a plan combining two old practices, mulching and deep tillage, which in its first trials promises to conserve water, improve drainage, increase aeration, permit deep root penetration, and slow down erosion. Spain and his associates have been thinking, planning, and working for four years to bring this idea to practical fulfilment.

The lecture that triggered the idea was given by Dr. A. R. Bertrand who was speaking on the subsoil fertilization research that he and Dr. Helmut Kohnke had pioneered. By applying fertilizer deep, Bertrand pointed out, we encourage deep root penetration which opens small channels in the soil for water infiltration and aeration. By this method, Bertrand hoped to overcome one of the major disadvantages of deep tillage. Chiseling deeply into the soil opens a channel through the hard packed subsoil to permit water and air to enter, but with the first rains, the soil begins to reseal itself and reform the barrier. It was at this point that the thought flashed into Spain's mind, "Stabilize the channel! Stabilize the channel by filling it with crop trash."

Some of Spain's associates laughed at the idea, but he was encouraged when men like J. B. Peterson, head of the Agronomy Department at Purdue, and his office mates, Don McCune and Garry Williams urged him to go ahead and devedop it. Putting the idea into practice proved easier than Spain had thought possible. "From the first," he said, "we had thought of a forage harvester as a way to pick up the mulch, chop it, and blow it down into the channel. But just how we were going to get the mulch to go into the channel worried us. McCune and I took our problem over to Ag Engineering and they told us it would be as easy as pie. Bruce Liljedahl over there, gave our problem to his class in machinery design and in the spring of '55 they came up with the basic plan which was a subsoiler with two wings welded on behind to hold the channel open for a few inches beyond the chisel. This gave us the opening down which we could blow the straw."

In the summer of 1955, Spain and his associates hooked this winged subsoiler behind a Caterpillar D2 tractor and pulled a forage harvester behind a second tractor to begin their first experiment. "We were working with rank, high clover," Spain recalls, "and decided to take one half a swath. It simply disappeared down the hole. Then we took the full five-foot cut, and it, too, was swallowed up. We also had a truck load of corn cobs with us and we tried them. Two husky boys shoveled them into the chopper as hard as they could and the cobs disappeared without a trace. That first trial gave us a surprising idea of how much the channel would hold."

Later they took their rig into wheat fields and blew the dry straw into the channel. They found that straw and other dry material tends to fluff out more in the channel, which holds the channel open better. They also found that the dry soil after wheat harvest was just right for deep tillage. Wet soil compacts the earth along the walls of the channel, smearing it over so that there is little penetration of water through the glazed surface. During the summer they used their vertical mulching on flat land and contoured the sides of hills as they tried to work out the best uses for the new technique. In 1956, they eliminated the second tractor by using a draw bar extention to pull the forage harvester behind the D2.

In the fall of 1955 they had their first chance to look over their work and see how it was holding up. Rain, at the rate of five inches in three days, gave them a chance to compare vertical mulching on part of a field with deep tillage without mulching

(*Continued on page* 114)

"50¢

The men of the stockyards are a breed apart. Long before most citizens are out of bed the truckers have completed their runs. The work of the commissionman calls for a unique combination of physical stamina, knowledge of livestock, and trading skill.

higher on prime"

THE TRACTOR-TRAILER backs up to the loading dock like a ferry boat maneuvering into its berth. It comes to a stop and the driver steps from the cab, lights a cigarette and relaxes as the yardboys take over the unloading of the steers.

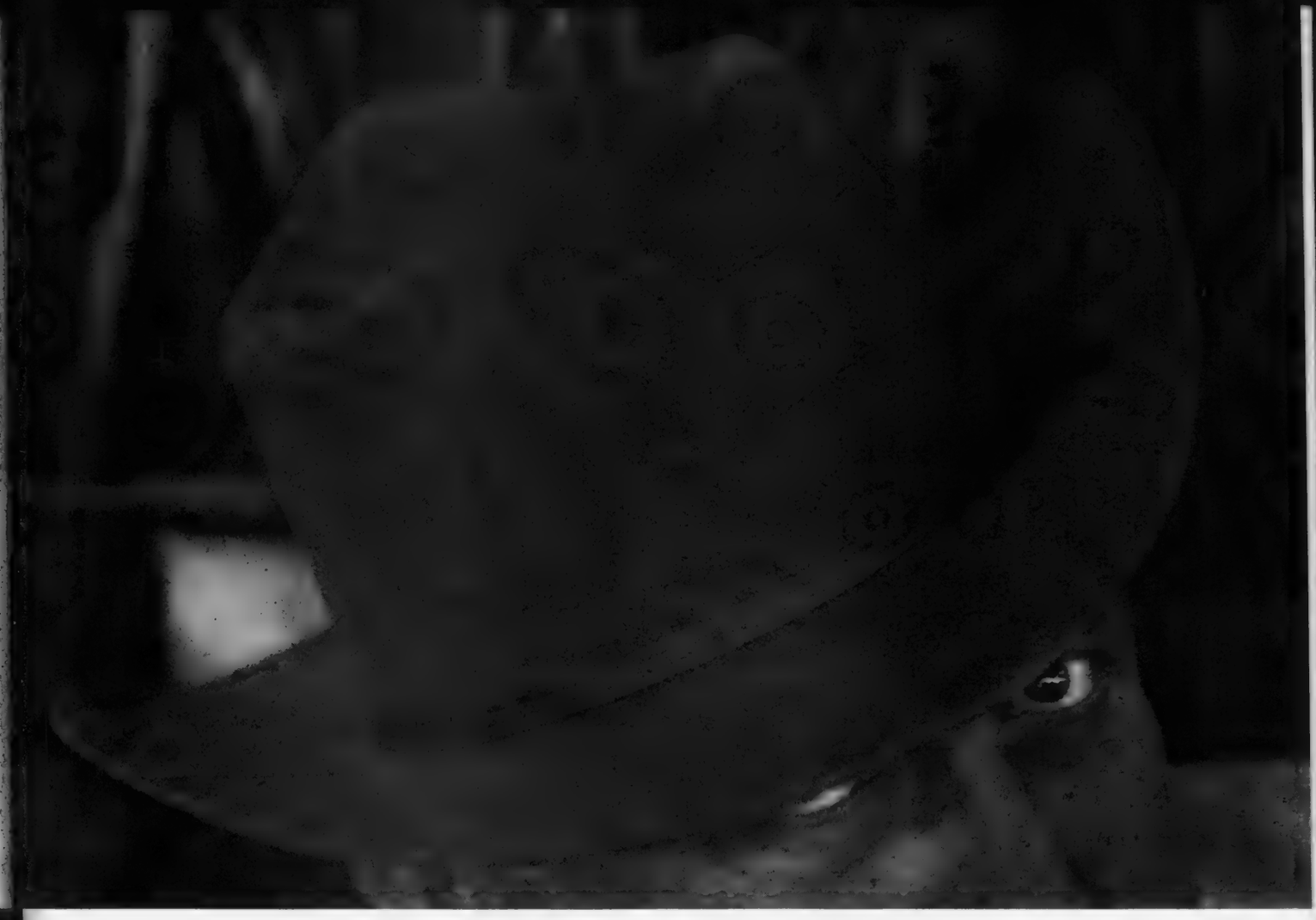
The tailgate is thrown open and a hoof gingerly feels its way across the sill; then the steer edges part way out, looks around carefully, and warily walks down the ramp followed by his companions. One of them suddenly unkinks himself, lowers his head, pitches, twists, and the whole broad-backed bunch breaks into a hobby-horse run down the alley. But the run is brief and they are soon bedded down in a pen, chewing their cuds in bovine contentment.

As the waning moon breaks through the clouds of the chill, pre-dawn sky, commissionmen stride down the alleys, pausing at each pen to inspect the day's consignments. Bundled up against the cold in their sheeplined coats their words become visible in little

Photos by Robert Goodman
Text by Charles R. Koch

"These are the ZT cattle you boys bought for me last year. They've been finished on 120 days full feed, and you know the way I feed 'em. They're good, honest cattle and they'll kill right. They ought to top the market, hmmm? Now you fellows treat me right."

"Got 'em priced too high? If I didn't know you better, Harry, I'd think you just didn't know. But you know cattle, man, and you know they're worth every penny of that price."



"I can wait."

clouds of vapor as they comment on the offerings.

"These are the kind the boys are looking for," says one, "start them 50 cents higher."

At eight the trading starts. A buyer on a close-coupled Appoloosa rides into the pen, makes a quick and expert appraisal.

"What'll they cost?"

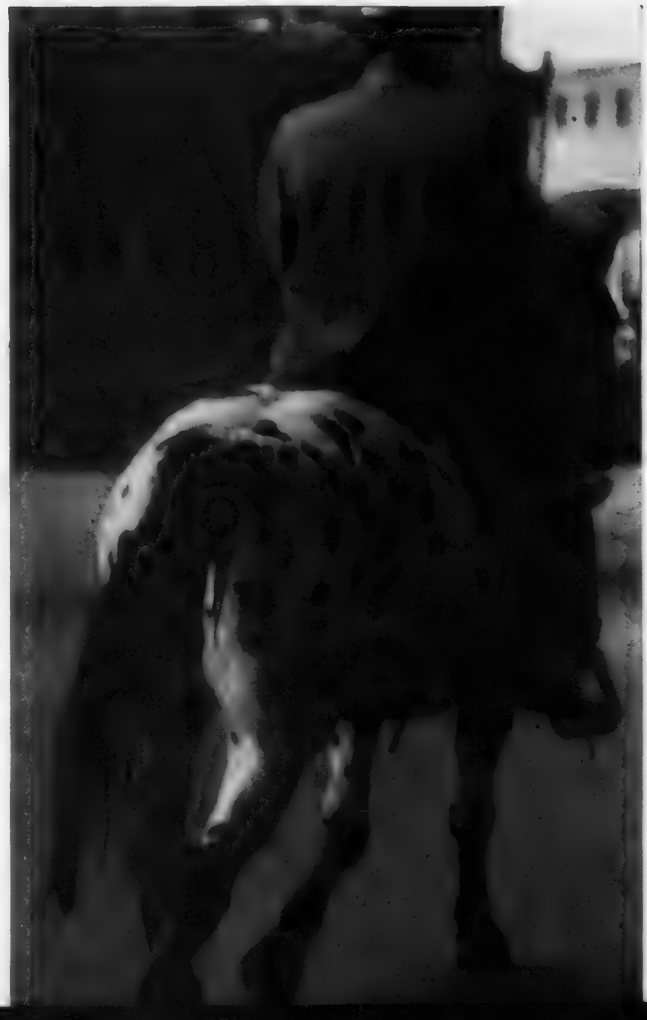
"Fifty cents more than yesterday."

"You've got 'em high enough."

"Thanks; always aim to get as high as I can."

But the buyer knows his cattle and he knows the market. The deal is closed and the cattle move to the scales.

Trades are completed all up and down the alleys. Farmers, ranchers, salesmen, buyers, speculators . . . give life to that intangible thing called the market. By noon the bulk of the offerings have changed hands. The buyers ride back to their offices to report on their morning's work. Tomorrow will bring more cattle, more trades, a never-ending drama staged in the early morning mists of stockyards across the country.



When the buyer turns his Appoloosa toward the office, trading is over.

Should I Incorporate My Farm?

THERE IS PROBABLY no term in the language so symbolic of American business as "Inc." And nowhere is it so rarely used as in farming. American agriculture has always been made up of relatively small units owned by individuals, or in some instances by partnerships, who have been able to finance the operations either entirely with their own capital or through loans secured by real estate or chattel mortgages. But with the double-barrelled impact resulting from the tremendous inflation in land and commodity values since the end of World War II and demands for capital and credit created by the introduction of new techniques and the almost complete mechanization of agriculture, farmers are showing increasing interest in the corporation as the possible solution to some of their financial problems.

They are finding, too, that inheritance problems, passing the farm along as a going unit upon the death of the owner, or the obstacles encountered in turning it over to an heir during the life of the owner, *inter vivos,* as the lawyers say—have a way of yielding to corporate procedures.

Then there is a third factor in the current interest in incorporation. Anyone who gives even the slightest consideration to the small farms of America is immediately impressed with their lack of capital. They are using "horse and buggy finance to do an atomic age job," as Professor Frank Miller, agricultural economist at the University of Missouri, puts it. Miller and others who have devoted themselves to the problems of these millions of small, inefficient units are of the opinion that the corporation may be just the tool to put them on their feet and build them into the kind of healthy, self-sustaining farms that will be a credit to their operators and the nation. How this might be done involves some changes in our system of land ownership and finance. We'll give it a look after we talk about the more conventional uses of the corporation.

In businesses other than farming one of the attractions of the corporate form is the protection it gives the owners against unlimited liability. Whereas in a partnership a relatively wealthy partner might find his home or other personal assets attached to satisfy debts of the partnership or a judgment arising out of an accident involving the farm truck, incorporation would protect him from such disasters. At least it would, in theory; but, unfortunately, theory and practice are often separated by a wide gulf. Such is the case here. Actually, if all the farmer's assets are in the corporation nothing is protected by the limited liability provisions; and financial institutions and others who are in the habit of lending money are fully enough aware of the facts of financial life to demand that the stockholders of a small corporation bind themselves individually when negotiating loans for the corporation.

One way that a farmer might keep some of his assets out of the corporation would be by holding them in his own name and leasing them to the corporation. For example, he might set his homestead apart from the rest of the farm and maintain his passenger car, his truck and other items in his personal ownership, leasing them to the farm.

"Tort" is an unfamiliar word around

the farm. To the lawyer it means a civil wrong independent of a contract; injury caused to a person in an automobile accident, for example, or damage caused when a farmer's bull goes through a hole in the line fence, courts a bunch of the neighbor's heifers and gores the neighbor's son when he comes to the rescue. While the corporation would insulate the owner of the farm from unlimited liability in such cases, it will usually be found much cheaper to carry liability insurance.

So much for the corporation as a device for limiting liability of the farm operator. If this were all it had to offer there would be no point in giving it further consideration. But it does offer other possibilities. It may be the ideal way to transfer ownership from one generation to the next, particularly where there are numerous heirs. Take the case of the Renk family of Sun Prairie, Wisconsin, featured in "Family Farm 1957 Style" in the Winter issue of THE FARM QUARTERLY. After the death of Mrs. Renk 30 years ago the family consisted of the father and 3 mature sons. All 4 Renks were top farmers and had no desire to do anything but farm for the balance of their lives. The boys were all working for their Dad in whom they had the utmost confidence, yet in the back of their minds lurked the inevitable question of how much of the place was theirs? What would happen if Dad married again? If something happened to him?

They talked the situation over and decided to set up a family farm corporation. Articles of incorporation were drawn up and stock was issued under the guidance of an attorney, the father agreeing to convey a large share of his interest to the corporation. Each of the sons, as well as the father, received a block of stock and officers were elected. Based on this solid foundation the farm has grown and prospered until it now enjoys nationwide recognition as an outstanding family farm.

Should one of the stockholders die or decide to sell out, there would be no need to break up the business to distribute his interest. It would merely be a matter of redistributing or buying in his stock. If a member of the on-coming generation wants a piece of the business and is qualified for it, he can be given stock or permitted to buy his way in. Under the Federal tax law, should any of these stockholders wish to give some of their stock to their children or other recipients, they may do so tax-free at the rate of $3000 per year up to a total of $30,000.

Transfer Without a Will

The Fred Ralph farms in New York are a good example of the manner in which incorporation may be used to transfer the farm business after the death of the owner. Ralph, a successful businessman, had acquired a number of good farms during the course of the last 40 years or more. He had a daughter and three sons, two of whom devoted their full time to the operation of the farms. The father and the sons agreed that the best way to handle the farms was as a unit. The principal income was from fruit, dairy, and poultry, with Robert, one of the sons, operating the fruit farms, and William handling the dairy and poultry farms.

Mr. Ralph had always been leary of making a will, but realizing the chaos that would result in the management of these farms were he to die intestate, he talked things over with his attorney and came to the conclusion that the formation of a corporation was the solution. All of the father's farm holdings, land and chattels, were included in the corporation together with some of the equipment and livestock owned by the sons. The mother and father and all four children were named as directors and stockholders and the corporation was capitalized at $100,000, upon the issuance of 1,000 shares of stock of $100 par value. The father retained title to the lion's share of the business while the other members of the family received stock in proportion to their contributions.

Not long after the incorporation was completed the father died. His stock was transferred to his widow and children in accordance with the intestate laws of the state without the slightest interference in the operation of the farms.

Another advantage of incorporation that was experienced here was the facility for spreading the risks of the various enterprises and of financing the expansion of one division out of the profits of another. For example: There are years when the fruit farms lose money or barely pay their way. Income from the other enterprises is then available to meet the deficit and since the various farms are tied together as a unit there is no trouble in transferring the funds from one farm to

(Continued on page 130)

Assembling a well organized, smoothly operating farm like this is the work of years. The death of the owner all too often is the signal for its dissolution. Through incorporation the farm can be put under the active management of one heir while the others retain their title and receive an income.

PLASTIC PIPE for farm water systems

This flexible, stretchable, inexpensive pipe is easily worked and won't burst from freezing

WHEN BILL HICKSON laid a water line from the well to the barn, he relieved himself of a nagging back ache that was irritated every time he carried a bucket of water—he also shut off a little nagging from his wife and kids that had been an irritation, too. The whole job took less time and money than Hickson had thought possible—and this, oddly enough, was one result of the work done 88 years ago by a couple of printers who set out to produce a cheaper billiard ball. With the help of Walter Spurlock, who runs a custom trench digger, he completed the whole job in an afternoon and it cost but 44 cents a foot for pipe, fixtures, and trench.

The main reason for both the speed and the low cost of the job was the plastic pipe Hickson used. He needed no expensive plumber and—except for a tee where he ran a spur line off to an automatic water fountain in the near pasture—he needed few connections or other fixtures. He simply unrolled the flexible pipe down the trench and around the corners. Where he did need them, he used aluminum fixtures which he forced into the slightly elastic pipe and clamped in place with a stainless steel, bracelet-type, screw clamp such as is used on garden hose connections. The toughest part of the whole job was putting the dirt back into the trench, most of which he did from the seat of his tractor.

The pipe which Hickson used is one of the newer formulations in this amazing field of plastics—the family of chemical substances which may some day be used to identify our period of civilization just as stone, bronze, and iron are associated with past ages. The whole technology of plastics has broadened enormously and matured since 1869 when John Wesley Hyatt and his brother, Isaiah, gave up the printing trade and developed the first real plastic in their effort to produce, of all things, a substitute for ivory billiard balls. The material which they concocted by mixing gun-cotton and camphor was used for the balls and a multitude of other strange and unrelated purposes. It was used for false teeth and men's collars, transparent panes for the side curtain of buggies, and later as the binder for automobile safety glass. The Hyatt brothers called it celluloid.

Following the discovery of celluloid, the

Around the bend without a hitch or a fixture the limber pipe is laid. A 400-foot line of this tough, light pipe can easily be carried on one hand and unrolled with the other.

The National Sanitation Foundation permits its initials to be used on all pipe it has approved for carrying drinking water. Some salvaged pipe may flavor and contaminate the water.

development of plastics followed the pattern of most new dicoveries—slow progress at first, but with increasing acceleration until the growth became so rapid and complex that it has broken down today into branches and sub-areas.

In the development of plastics the second milestone came in 1907 when Dr. Leo Baekeland, in an effort to find a substitute for the natural plastic, shellac, found that the insoluable, heat-resistant, gummy mass formed by the combination of phenol and formaldehyde could be molded into thousands of useful articles. This dark plastic, which the discoverer called Bakelite, was followed in 1929 by the urea-formaldehyde plastics Beetle Ware, and Aldur, which could be manufactured as pure crystaline material or tinted any color of the rainbow. After this the race was on and improvements in old materials, new materials, and variations of both were constantly being brought out. The war, with its imperative demands for such new materials as synthetic rubber, added a new push to the plastic industry.

One of the major plastic substances used in manufacturing water pipe such as Bill Hickson used, polyethylene, was first prepared in 1933 and produced commercially in 1939. Though polyethylene dominates the field, newer plastics such as butyrate, styrene copolymers, and polyvinyl chloride are now on the market competing with it. Hickson and other farmers who have used the polyethylene type pipe have found that its flexibility has made it possible to do a pipe laying job with few connections and without a plumber's license. The flexibility also protects the pipe in the winter, for it remains stretchable and undamaged even below freezing. Though the material softens at temperatures above 120 degrees and, therefore, cannot be used for hot water lines, it does not grow brittle until it reaches 90 degrees below zero Fahrenheit. It is also resistant to corrosion from the chemicals of the soil or from fertilizers. Even in what hydraulic engineers call "agressively corrosive water" that practically dissolves galvanized pipe in two or three years, the plastic pipe is unaffected. It can, however, be damaged by gasoline and other petroleum products, and for this reason care should be taken not to use oil or vaseline or other pipe dopes in lubricating the pipe when making a joint. This caution is particularly applicable to the polyethylene pipe, for there are special plastic pipes, some of the rigid ones, which are impervious to the effects of petroleum products and may be used to transport them.

The material has neither taste nor odor, which is a great advantage, but also has its drawbacks; rodents will gnaw on it. They don't seek it out particularly, but gophers, beavers, muskrats, and squirrels have all been known to chew on the pipe.

One of the difficulties in generalizing about plastic pipe is that there are so many different plastics to choose from for special purposes—it is a little like generalizing about metal pipes; the same statement won't apply to both lead pipe and galvanized iron. So that most of the statements here refer to polyethylene pipe which makes up around 90 per cent of the market. And for each statement made there is probably a contradiction—there are special pipes made for handling hot fluids, and there are others to be used with gasoline and oil, some are damaged by ultraviolet light while others are impervious to it. For special and unusual uses it would be well to consult one of the manufacturers of plastic pipe—there is almost sure to be a pipe to fit the particular need.

The advantages and disadvantages of the polyethylene type pipe are emphasized when it is used in a deep well. The plastic pipe can be taken from the roll and lowered down the well in one long, flexible tube, whereas galvanized pipe, which weighs eight times as much, must be connected and lowered a length at a time. If anything goes wrong with the installation, the comparison is even more startling when it comes to pulling up the tremendously heavy, cumbersome galvanized pipe or in snaking out the plastic tube. This is all true in wells up to around 85 feet deep. Beyond that depth plastic pipe should not be used for, in spite of all its virtues, the plastic pipe cannot withstand pressures greater than 75 to 100 pounds per square inch where the galvanized iron pipe can operate at pressures of up to 800 pounds. The force necessary to raise water from deeper than 85 feet is too great for the plastic pipe.

Plastic pipe comes in conventional pipe sizes; ½, ¾, 1, 1¼, 1½, 2, 3, 4, and 6 inches. Normally you would use the same size pipe that would be used in a galvanized pipe; the plastic pipe, however, will do a better job because there will be less friction loss due to the extreme smoothness of the material. In terms of cost per foot, plastic pipe runs about the same as galvanized pipe of comparable size in most parts of the country—Hickson, who is a sharp shopper paid, for instance, 14 cents a foot for one-inch pipe. When it is installed by conventional methods, however, it runs around 20 per cent lower in cost because of labor saved.

The only trouble with these figures is that conventional methods are being abandoned when it comes to installing plastic pipe. Because the pipe is not damaged by freezing, there is no need to put it below frost level in installations where it is to be used only during the warm season. In such situations it can be buried in a shallow trench scratched out by a plow and covered by a scraper. The pipe should be buried, however, for sunlight will damage it. But even in deeper installations, agricultural engineers have developed some clever ways of burying the pipe cheaply. One of the neatest of these is an attachment to a deep tillage tool that threads the pipe down to the maximum depth reached by the mole or subsoiler. As the tractor pulls the tool through the ground, the flexible pipe is laid at a depth that is below frost line for most parts of the country.

Fixtures such as couplings, ells, tees, reducers, and adapters with one end threaded for joining plastic pipe with

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Where fixtures are needed, such as the reducer shown here, there is a choice of aluminum, stainless steel, or plastic hardware, all of which resist corrosion.

GROW

AT EACH CENSUS TAKING and at each sampling between census years, the nation's farms, during the last two decades, showed an accelerating trend toward bigness. In terms of land and men, of management and tenure, the change was gradual, unyielding, motivated at cross purposes. By 1957, the pattern stood out in cold statistics. Farms are fewer and bigger.

At one level loom the big few, the large-scale operators, whose hired hands wait in line for their Saturday noon pay checks. These giants are still few, but they are growing, both in acreage and numbers. By the first of the year, they totalled close to three per cent of the nation's farms, yet their productive capacity was enormous. At the other end of the scale a new farming group has been emerging. These are the part-time farmers, the 5-, 30- and 60-acre farmers from office and factory who are turning out farm products at well beyond the subsistence level. Their numbers have risen sharply in some areas. Their contribution, their competition, cannot be shrugged off when markets, land prices, and farm labor have felt the impact of their mounting influence. A good many farm equipment manufacturers have geared production to the needs of these small-scale operators. Decentralized industrial plants are setting up in locations where they can attract workers who view part-time farming as a desirable way of family living.

Between these two extremes of the big men and the part-timers stretch the vast three and a quarter million family farms, good-sized farms, medium-sized farms, small specialty farms with outsized incomes, great tracts of land with woefully inadequate incomes, farms left at the mercy of the weeds by the oldsters whose sons have moved to town, tenant farms, hobby farms, farms under professional management. There is a definite pattern here, too. The number of farms in this wide classification continues to dwindle. The number of operators have also decreased. Fewer men, fewer farms, are turning out greater production. The smaller farms are going out of business. The one-man unit has become larger than ever in acreage. Machinery investments have reached an all-time high. Unexpectedly, rented ground is on the increase, and also surprisingly, tenant-operated farms, in many parts of the country, show greater out-put than owner-operated units.

Among these middle-group farmers, some have what it takes to grow and survive, some do not. By 1958, a few will have grown bigger, and more of them will be on the swing shift in town, their holdings swallowed up by those who remain in the race.

The factors that make for survival are varied. Land and machines and capital are less significant than the men who use them. "There's more in the man than there is in the land." What does a man have in him that causes him to prosper on the farm, while others fall by the wayside? What are the trade secrets of growth?

Here are a few of the answers, a few of the methods of men who have seen the handwriting on the wall; here are a hand-picked group of veterans and latecomers swath-cut across the corn country, whose experiences pin point the trend. All of them are high in the middle-group bracket. Most of them are copying the successful methods of the large-scale operators whose ranks they will some day join. They were chosen because they are men in motion. They agree, man to man, that only in growth is their assurance of survival.

These farmers know that today standing still is death—here is how they grew and how they plan to go on growing bigger.

OR DIE

"Maybe there aren't as many big-time operators as we are led to believe. But think of their tremendous production. The rest of us have to adopt their methods to beat them at their own game. They have one disadvantage, for farming, like any business, starts to slip whenever too much uninterested hired help must be depended upon."

—Lawrence B. Curtin, Stonington, Illinois.

Young Curtin was lucky. His father was a progressive farmer who started out as a tenant and eventually owned 400 acres of good, black, Illinois soil. Of the 7 children in the family, 4 were university educated.

Lawrence, the third son, along with one of his brothers, leased 270 acres of land in 1948 while they were still helping out on the home place. In part return for their home labor, they were permitted use of their father's machinery on the rented ground. Lawrence banked a nice nest egg in those two years. In 1950 he was drafted. He served 21 months, with a tour of duty in Korea. On his return, with his severance pay and his savings, he entered into a 50-50 partnership with his father, buying into the machinery. Together, they farmed 480 acres in 3 separate tracts. In less than a year, his father died as the result of a haying accident. Lawrence bought the other half of the operating partnership from his mother.

He went into purebred Angus, selling breeding stock. The herd has been slowly increased to the point where 80 acres of ground is thoroughly covered with manure each year. In a normal year, their manured ground can produce 100 bushels of corn without fertilizers.

"The 50-cow herd is our wealth," he says. "I'm convinced nothing could improve our fertility so well. It provides off-season work for me and a hired man. It's a steady investment, too, with no need for speculation in bought feeders. At times, we buy a dozen or two steers to add to our culls, for a full lot doesn't take any more time to feed than several head. We raise about 10 litters of pigs a year, mostly to follow the cattle.

Curtin believes a farmer must be a good businessman. Records to him are important, but record analysis is even more so. Curtin isn't fearful of the decline of the family farm. He thinks it is changing, not dying. "Invest more money, add more ground and push for bigger yields so you can keep up a decent standard of living and it's still a family farm," he says.

"You've got to stretch yourself. You've got to have all the land you can handle and every acre must pay out. You need up-to-date buildings so you can handle more stock with less work. If you don't have the buildings, you'll have to make them yourself, to cut costs."

—Richard Dawson, Delaware, Ohio.

When Dick Dawson got out of the navy in 1950, the home farm of 115 acres was just limping along. His father had been killed. Dick and his wife were warned that a depression was sure to follow the war. They went easy, working the 115 acres in partnership with his mother, while renting additional ground that gave them a total of 160 acres.

At that time, 150 hogs, 25 beef feeders and several hundred hens were tops for them. "We were nowhere near our potential," says Dawson. "First you have to know the maximum your land and labor can produce, then you've got to produce it. We couldn't add more ground and we didn't have the feed to increase our livestock. But we had time, labor. Fertilizer and lime wouldn't help much. Wet spots in our fields were the limiting factors. So, in 1950 we decided to make the most of what we had. We began by installing 1900, and later, 1200 rods of tile. That opened the way to better yields and gave us a chance to raise hogs on alfalfa. This year, 250 hogs are on feed."

To spread the risk, feeder cattle were increased as well, after an old barn was remodelled for better labor efficiency. Feeding is done by conveyer. The barn was altered so it could be readily extended to accommodate 150 feeders.

A 32 by 80-foot tool shed and shop was built. To cut costs, haying equipment is owned in partnership with a brother-in-law, and a self-propelled combine is shared with a neighbor. Hired labor, too, is shared, with a hired hand working two days a week for Dawson.

Until he gets all his improvements paid for, Dawson plans to keep other irons in the fire. He takes in about $2000 a year from the sale of seed corn and fertilizer and as a county ASC committeeman.

"I believe in simplifying everything I can," Dawson states. "With the grinding system we set up, I can do my grinding once a week, at night if necessary. The underground wiring system I installed myself. With a few extensions, the building could be made to accommodate what I'm shooting for—600 to 800 hogs and 150 feeders."

"Don't try to do it all yourself. Profit from the labor of others. The wise farmer is a good manager not only of land, but of men. It is smarter to apply your own abilities where they will do the most good, letting well-chosen help handle what they are capable of. Pay them incentives, of course, but avoid share cropping. And line up something tangible to use for credit. Use that as a jumping off place."

—L. H. Spears, Rossville, Kansas.

You've got to hand it to Spears. He has a system. He started with nothing, had no backing. Now, just turned 50, he owns 1200 acres of Kansas wheat ground, some of his irrigated land running $800 an acre. "A farmer can marry acres, of course," he says. "I earned mine."

In 1931 he managed an orchard for $60 a month. He somehow swung the down payment on a 160-acre piece of ground, got a long-term loan, farmed it when he had time away from the orchard. He borrowed $100 on life insurance as a down payment on a used tractor outfit to get in his first crop. His first profit set his plan in gear: build up that 160 acres as a base that could be depended upon to supply the cash for expension. He has never changed his thinking. When he sets up a program, he sticks with it.

His is a two-year rotation, wheat and sweet clover. Corn is not dependable on his soil At most, he totals not over 25 acres of corn and milo a year. His wheat, of which he has a 338-acre base, runs from 38 to 42 bushels an acre. It wasn't like that years ago. Most of his land he acquired as run-down soil, at a price.

In the '30's, when not even nickels were laying around loose, Spears was one of the first to go all out for soil conservation, with heavy fertilizer, ponds, terraces. He started with 100 head of sheep. They netted him $6,000 in 4 years. The drought hit in 1934. Cattle, even the best registed stock, were being bought by the government for $20 a head.

He was a family man. For a year, he squeezed in the time to go back and forth to college to complete his degree, while keeping up his farm work. The next few years he rented 480 acres in partnership. As soon as he was able, he got his wife, Edna, all the household conveniences they could afford to give her more time to help with the farm work. He put in an electric milker, when they were a rarity, so his two girls could do the milking of their 12 cows. The whole family put in an 18-hour day. "We seldom knew what it was like to be caught up," he relates. "If we got near it, we'd take on extra jobs."

Spears grabbed a chance in 1939 to buy 40 white-faced heifers at $22.85 a head. Now he has 75 head from that basic herd. In 1940 he bought 80 adjacent acres. By farming in the day and selling insurance at night, he paid it off in two years. In 1946 he added a quarter section. As soon as he acquired land, he started an intensive rejuvenating program. Next, he added a hired hand, rented 400 more acres. "I hate to see the day when I'll have to depend on a tenant. My two hired hands have always been on a cash-salary basis, with a house and miscellaneous food furnished."

Spears and other farmers around him have a neat deal for expansion without tenancy. "You buy a farm with a house on," Spears explains. "The house is useless. You put it on a truck, haul it to town to a little lot that doesn't cost you too much. You fix the house up a bit, then sell it for a good slice of what you paid for the whole farm. The land is all that matters to you." Over 20 such houses have been moved into the little town of Rossville, Kansas, in recent years.

Spears thinks that if a farmer isn't primarily a businessman, rather than a dirt farmer, he hasn't much of a chance. And, in his area, the outlook is not bright for a farmer who can't irrigate. The ponds Spears built in the '30's have been lifesavers in recent years.

How big is big enough? Spears has all he can handle. He won't take on any more. "I don't want to get my operation so big it's unwieldy," he says. "My present labor and land and machinery are going at top efficiency. Why reach too far?"

"I believe the choice of enterprise is the most important thing to consider, especially where land expansion is impractical. Pick an enterprise that fits your farm, your location and your available help, an enterprise you can put your heart into. It takes more than work and good management. It takes pride. Specialize. Cut yourself out a reputation for quality instead of just quantity and you'll have more to pass along to your children than just a piece of ground."

—J. W. Riley, Brookston, Indiana.

At 24, Riley struck out for himself on a rented farm of 145 acres. He had a little of this, a little of that, but it meant subsistence for his family. Times were tough. The depression was at its height. After four years, he quit, had a sale and went into a selling job.

But farming was in his blood. When he acquired enough of a nest egg for another try, he went back, in 1939. He rented 139 acres, putting all his ready cash into equipment; a good bit of it was second hand, which he rebuilt. He narrowed his enterprises down to corn growing on the rented ground, with heavy emphasis on custom work. Both paid off. By 1943 he was able to buy 78 acres of adjoining land and had a full line of up-to-date equipment.

The custom work could not last indefinitely. Riley saw the handwriting on the wall. He needed more land. Due to the death of an uncle, he acquired a third interest in an unsettled estate of 132 acres, 17 miles distant. He and his wife took over its management, milking at the home place early in the morning, loading the equipment on a truck for the trip, farming until dark, then returning home for late milking. By then he had a Gurnsey herd of 30 head in milk.

By 1948 he was employing a hired man so he could take on the added responsibility of 240 acres near home. They moved their house from near the river to make it easier for their boy to get to school.

"By then I knew I was headed towards all-out dairying," Riley says. "But reorganization was needed. The extra land and the extra help were not the answer. Jim, Jr., was then 10 years old and I felt I could rely on his help with the milking. So we cut back the farming land to 213 acres and let the hired man go. We added a few Holsteins."

By 1953 Jim, Jr., was in high school and, as a member of FFA, nagged his father into keeping better records. They made a careful analysis which showed that their profits on grain was small, but milk was paying reasonably well. Young Jim suggested that they go into Grade A milk production along with grass farming. The field arrangement was revised and a milking parlor and a new barn were built.

It's a partnership now, primarily planned around a fine herd of 68 registered Holsteins, 42 of them in milk. Jim, Jr., owns 14 head in his own right. He won the Hoosier Farmer Degree. This fall he will enroll at Purdue in Dairy Production. He is close enough to Lafayette to keep up his daily work at home while attending college.

"We have some top cattle which are making good test records and we're getting a name for ourselves in the show ring. We haven't hired any outside help since 1948. Dairying can be both interesting and profitable if the whole family pitches in. Boys won't leave the farm if given a chance to earn something and learn something worth-while."

"Buy big machines, on credit if necessary, and do custom work, if you can take it for long hours. It's a good beginning. Custom work does you a bank roll quick. Then you can buy more land, and land is what you're really after."

—Pete Perona, Mulkeytown, Illinois.

In 1933 Perona graduated from high school with an A average for all four years. His principal urged him to attend the University of Illinois, offering to make all arrangements, including lining up a job so he could earn his way through. He had to turn it down. His stepfather had died when Pete was nine. "We were as poor as people can get," he remembers. "My mother was working as a chambermaid in a hotel at $12 a week to support the family."

The stepfather had left the family with 44 acres of land on which a mortgage of $500 remained. They paid it off slowly. When Pete graduated, they bought a house for $150 and moved it to their 44 acres.

Pete's first farming job was to grub out, by hand, the cut-over timber on the 44 acres, of which only 17 had previously been cleared. Somehow, that first year, the family purchased a team of horses, a cow and raised 50 hens. It was rough going, and each child had to do his part. At year's end they showed a gross income of $483.

Their first corn crop averaged 20 bushels per acre. That set Pete on the road to reading every scrap of agricultural advice he could find, attending every extension class or farmer's meeting he could reach. He spread lime the hard way, by shovelling it from a wagon. As soon as he could, he got 4 more cows plus 2 sows. He rented corn ground. He worked for neighbors at $1.00 for a 12-hour day. During winter months, he cleared more of his own land.

His wisest early financial step, and the most important step he ever took he says, was the purchase of an F-12 Farmall for $350. It gave him a chance to do plowing and disking for neighbors and it led him into extensive custom work.

Competition became keen. Rates became unprofitable. He held his own, taking the jobs others refused. He was on hand when he was needed. In 1945 he bought 87 adjoining acres, rented extra ground and milked more cows to increase his income, pushed custom operations in a final spurt and in two years paid off the 87 acres. That ended his custom work and gave him his real start as an owner-operator. He owned equipment which his acreage wouldn't ordinarily justify.

Buildings, of his own construction, followed. More land was rented. Soon he was farming 400 acres. Operating costs began to pinch. He added more cows and built a grade A milking parlor to boost his net on milk. He now milks 25 head, using a glass pipeline milker, is shooting for 35 head to warrant installation of a bulk milk tank.

It isn't easy to get owners to pay for lime and fertilizer for rented hay and pasture ground. "And why spread manure on someone else's land?" he asks. To supply the additional top hay and superior pasture he required, he bought an extra 55 acres late in 1955. This gives him ownership of 186 acres. When he gets to 240 acres he will stop renting ground. Farms in his community, a coal-mining county, are small and mostly with buildings on them, which runs the per acre valuation up. Bidding for these small units by would-be city farmers hoists the price beyond the land's capability to pay off.

Perona has reached the point where he can think of his own comfort. For the past two years he has been at work on a 3-bedroom brick home for his family. When completed, at an expected cost of $10,000, it will be in the class with homes costing over $25,000. He has only recently finished a 40-by-70 pole machine shed, intending to convert his old cement block machine shed into a laying house for 600 hens soon to be brooded. "I'm no in-and-outer," Pete says, "but every building I have is designed for easy conversion to some other enterprise. You have got to lean with the wind. If I see a chance to better myself by a change in program, I don't want a building to hold me back.

"Our biggest spurt came from bulldozing out the fence rows and putting the fields together so we could operate a big tractor outfit and one man could do the work of two. That started a chain of events which put us where we are today. For us, expansion in the only direction we saw possible, opened the way to further expansion."

—Robert G. Stump, Winchester, Indiana.

At 35 years of age, Robert Stump has had only 8 years of full-time experience as a farmer, but they have been rewarding years. He operates a 300-acre rented farm in partnership with his father. Back when he came into the partnership their program was to market 150 hogs a year, milk 4 or 5 cows and maintain a 150-hen flock. In addition to corn, oats, and hay for on-the-farm use, each year they have planted 25 acres of wheat for certified seed, 20 acres of soybeans for certified seed, plus 40 acres of commercial soybeans. Their first corn crop was good. To increase income and make fuller use of available labor, more sows were bred the second year. That year they sold 250 hogs.

In 1950, their third year, they expanded in the only logical manner. They couldn't add acres, so they increased in labor efficiency by rearranging their fields. The far end of the farm consisted of 4 fields of 30 acres each. The fences were poor and the fence rows brush-filled. A bulldozer made short work of combining the field into one large field. This allowed the Stumps to farm the field in a different direction, making the rows from 100 to 160 rods in length. A larger tractor and outfit seemed a wise purchase. They decided on a crawler with a 4-bottom plow and 10-foot equipment. It cut field work time in half.

"That lead to more time to handle increased livestock," says Bob. "With the increased manure, we felt that we could safely add another year of corn to at least part of our rotated fields, using corn-corn-corn-oats-hay-pasture. On the remaining fields, we switched to corn-soybeans-small grain, with an intercrop of sweet clover. This puts half of our total acres in corn every year."

By 1951 they had more than enough corn to fatten 350 hogs. However, they were far behind the potential the larger equipment had made possible. They added a number of feeder cattle to utilize the excess corn and excess roughage. In 1952, hogs seemed a good bet. They raised and sold 400. They bought feeder cattle again, sold 66, while reducing to one dairy cow. They tried putting their first cutting of hay into silage.

The following year the father-and-son team sold 500 hogs. They began placing portable corn cribs, at picking time, where the hogs were to be fed the following summer, making it possible for one man to feed 500 head in an hour. Two years ago the corn was unusually good. They couldn't handle more sows in their farrowing houses, so they purchased 200 feeder pigs, increasing their volume to 600 hogs for the year. They converted a laying house into a shelter for little pigs and changed to a three-week weaning schedule. In the past two years inexpensive additions enabled them to market 1000 hogs annually. A 200-ton self-unloading bunker silo was built, which allowed feeder cattle numbers to be boosted to 90 or 100 head.

Bob Stump believes that fewer enterprises is the key to success.

How did Martha Back feed, clothe and school a family on a tiny mountain farm? "I can't tell you," she says. "You would have to do it to know how."

By R. J. McGinnis

Mountain Woman

MARTHA BACK raised nine children in a three-room clapboard cabin on a thirty-five-acre farm in the high hills of southern Kentucky. She is seventy-eight now, a widow for fourteen years, and she lives alone in a house she came to as a bride. She gets around well and on good days will walk the mountain paths to visit a son who lives across the valley. Several years ago, from her first old-age pension check, she bought herself a set of teeth. They are a little loose and she doesn't dare smile as wide as she might. She is lean and boney and wears her hair in a tight bun on the back of her head. Her eyes are china blue, like her Scotch-Irish ancestors.

When Martha Back is asked how nine children were clothed and fed and schooled on two acres of corn and beans, a few half-wild sheep on the mountain, and a flock of geese which wandered up and down the branch, she tells you, "You would have to do it yourself to know how."

When John Back married Martha Dixon fifty-four years ago, he took her to a two room log cabin on Spring Branch. He had thirty-two acres, a mule, a dozen or so sheep, a hill-side plow, and a mudsled which he had made himself. There were several strips along the branch, a little more than an acre in all, which were level enough for a crop, and about an acre on a cleared hillside where he planted corn and beans and pumpkins and a garden. Martha's mother had given her a pair of geese and a setting hen with fifteen eggs under her. In the house were a homemade bedstead, three hickory split chairs, a table, and an odd collection of pots for the fireplace. There was a corn husk mattress on the bed and two quilts which Martha had pieced herself during the three years that John came over the mountain to court her.

That first fall when the corn was picked, John loaded half of it on the mudsled and took it to the mill at Indian Bottom, eight miles away. The other half of the corn went into a pig which a neighbor had given him for a week's work cutting fence posts. Martha combed and carded the wool from the sheep, carried it to her mother's loom, and made a strip of cloth for their winter clothes. She sewed these by hand—dresses, shirts, pants, coats, everything from the same strip of cloth, scratchy and rough, but durable and warm. She plucked the geese and made their first pillow and used the fat from the hog to make lye soap, using ashes from the fireplace to make the lye. Their diet, day after day, was corn meal mush, beans and back fat. That winter John made $15 working in a sawmill. They spent $4 on a wooden pump for the well and the remainder on salt and thread and odds and ends. "It just slipped away," Martha says. "We spent it all and I can't remember for what. That's the way with money."

Then the children began to come. The corn rows were pushed a little further up the hillside, and even the patches on John's overalls were patched. Months on end there was no money in the house; it was either borrow, barter, or trade. John helped a neighbor put up a chimney and brought home a ham. Martha could make the best soap on the Branch—white and hard and clean-smelling. She traded a bar here and a bar there for salt or a jug of sorghum or the rare luxury of coffee.

When the lumber companies began to log off the mountains John got work

(*Continued on page* 110)

On their way to church, children cross a swinging bridge from their home. Kentucky mountain people take their religion seriously. Baptists all, they plant a roadside cross as a daily reminder.

NEW SEAMAN-ANDWALL ROTARY TILLER CUTS HORSEPOWER REQUIREMENT UP TO 28%

The NEW "SWEDGE-EDGE" TINE

First point of impact with the soil is at this point. Greatest horsepower load is imposed at the impact-moment. In the new tine initial impact is confined to a very small linear distance with a BIG reduction in horsepower. Because of pitch and rake the tine then has a slicing action along the sharpened edge to the full tillage depth. It cuts soil rather than "pushing" it, another relief in horsepower demand. The tine is completely self-cleaning and self-sharpening. Much longer lived.

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MONEY ON THE WING

(*Continued from page* 43)

feed the bees en route. They are shipped to all parts of the country by air, truck and railroad and to many foreign countries. The standard 2 lb. package sells for $4.00, which represents 50 cents for the box, $1.50 for the queen, and $1.00 per lb. for the bees. The 10,000 lbs. of bees in 2 and 3 lb. packages requires 5,000 to 6,000 queens.

There are about 5,000 bees to a pound. However, if the bees have access to a quick and easy source of sugar or sirup before they are weighed, this number will be reduced to about 4,000 per pound. In weighing bees for shipment, Whitcombe makes allowance for this, although he says that no one has ever counted the bees in a pound to check up on him.

Three pounds of bees, or 15,000 head, will increase in a short time to 50,000 or 60,000 if nectar is plentiful. A hive of this population will sometimes produce as high as 2 to 3 pounds of honey per day in the west, where trips are long and flowers are hard to find. In the Midwest, where there are plentiful flowers and short trips, especially during the season when fruit trees and clover fields are in bloom, a hive will produce as much as 15 pounds per day. During the season in California a hive will produce a maximum of 60 pounds. In the Midwest, and in some parts of the south, a hive may produce as much as 200 pounds.

Whitcombe also spends a great deal of time raising queens for this package business. This is quite an art in itself. However, the bees do make it easy in that a queen or a worker may come from the same egg. The amount of royal jelly (a type of predigested food) which a bee is fed as soon as it emerges from the larva stage determines its sex and occupation. A bee which is fed royal jelly exclusively until maturity becomes a queen. Each hive will produce a large number of queens, but only one, the comliest and most fertile of the lot, is allowed to live; all the others are killed by the workers or the remaining queen. The bee keeper who is raising queens shuts out the workers from the queen cells and allows all the queens to develop. A queen will sometimes live to be 5 or 6 years old in spite of the fact that she lays thousands of eggs per day. Ordi-

HOW TO KEEP BEES

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Let us send to you at no charge, booklets on beekeeping. Extension Bulletin # 253 which tells of experiments with Honey Bees and clovers, and your 1957 catalog of Root Quality Bee Supplies—Everything you need to start this spring in time for the early fruit blooms and the clovers that follow.

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Aldrin is available in all popular formulations. Apply it as a dust, spray, as granules, or get it ready-mixed with starter fertilizer. Any way you use it, you can be sure of effective soil pest control. Aldrin formulations are economical. In most areas, you need only a few ounces of actual aldrin per acre for top control.

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narily, 2 years is about the maximum life of a queen.

In addition to the production of honey, pollination services, and the sale of package bees, Whitcombe also has a small but steady income from the sale of beeswax for commercial purposes. Most beeswax now goes into cosmetics and into church candles. The price has steadied down to about 50 cents a pound. There is about 30 lbs. of beeswax to every ton of honey.

Last year Whitcombe's bees grossed $30,000. His biggest outlay was for materials, hives, supers, frames, packages, etc. His labor cost was low—he and his son, and in a pinch Marie, did practically all the work.

How to Start a Bee Business

If Harry Whitcombe were young again and had to choose a career, there is no doubt that it would be bees. "There is perhaps more promise in the business today," he says, "than there was thirty years ago. Honey will have its usual steady market as a table sweet, and a growing use as a source of sugar in baking and candy making. The use of bees for pollination is only in its infancy. Wherever crops are grown for seed or trees for fruit, there is a potential market for bee services. The drug industry has at last begun research on honey and pollen. Honey, as an antiseptic, has been known since historic times, and its virtues as a high energy food for the physically active has been demonstrated recently. It was with the conquerers of Mt. Everest and many athletes at the recent Olympic games included it in their diets."

For those who have the yen to launch a bee business, Harry Whitcombe has sound advice. First, he says, know bees. The best way to know bees is to work with them. He suggests that a good way is to get a job with an established apiarist and learn from the bottom. After gaining a thorough knowledge of how a bee operates, the business end of the venture will depend on how shrewd the individual is.

When you learn enough about bees to handle your own, start modestly. Your apiary can be stocked from package bees or you can buy a few stands and allow the bees and the multiplication table to take care of enlargement. As insurance, it might be well to make bees a sideline at first, retaining a bread-and-butter job.

No one, says Whitcombe, should venture into the bee business if he isn't willing and able to work long hours and do the physical labor demanded of a stevedore. During the busy season a bee man works seventy to ninety hours a week. He lifts honey-laden supers all day long, and a super can weigh a ton at the end of a day. And you must like bees too. This, says Whitcombe, is the basis of his business success.

A great deal depends where you start

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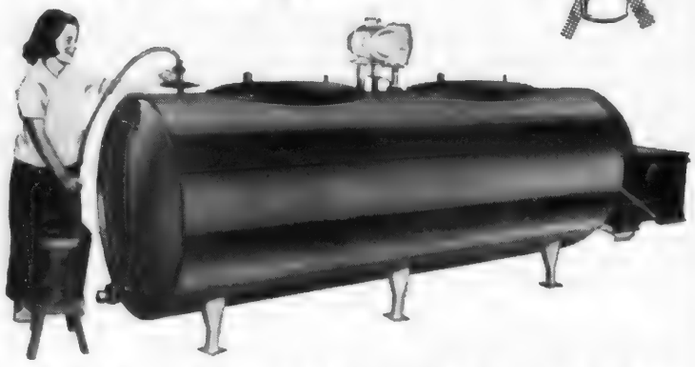

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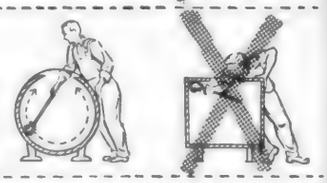

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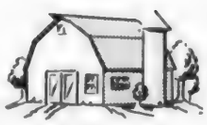

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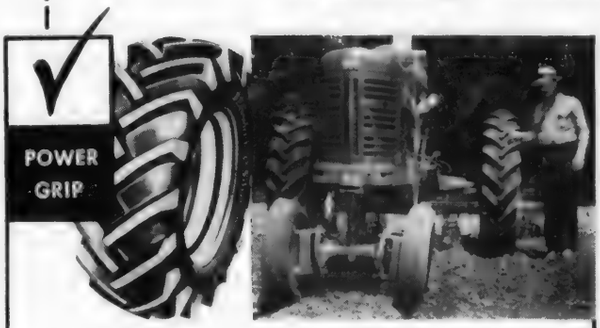

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11-38	4	106.15
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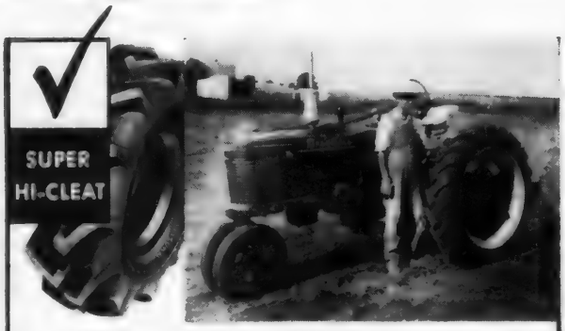

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in business. In some areas where there are few seed crops or orchards, the Midwest, for example, the sole income will have to come from honey, with a possible by-product of beeswax and pollen. The availability of large sources of nectar, like flower gardens, clover plantings, or wild flowers, is important. In areas where bee pollination is established, how well the entrepreneur meets competition will determine his success.

If package bees are indicated, markets must be cultivated and a reputation established. If the beginner can combine a package business with honey production, he can take two profits.

Harry Whitcombe had to scale down his "million at forty" plan, but somebody might yet make it. It's possible.

You're in for $16,000

A man can go into the bee business with a capital outlay of about $16,000 and expect to make a fair living. This would include 600 hives, two-story, complete with honey frames, at $12 a hive; 1200 extra supers at $3.50 each; a new truck, $3,500; extracting equipment, $1,500; and incidentals, such as smokers and face veils, $600. This can be shaved by buying a second-hand truck and by shopping around for bargains in bees. The going price for a hive is $12, but a bargain often goes as low as $6. The above adds to $16,000 without a plant. A barn, shed, or garage can serve as a storage and extracting plant.

The marketing end of a bee venture varies with geography. In the West, the chief income is from pollination and package bees; in the Midwest, the big money item is honey. Pollination and the big honey flow comes at the same time in the Midwest and cuts down income. On the other hand, the honey yield is greater in the Midwest, often going as high as 200 pounds in a season, while 60 pounds is regarded as large in the West. The Midwest operator would have to charge more for a job of pollination than his western colleague, since honey flow is greatest when the orchards and clovers are in bloom.

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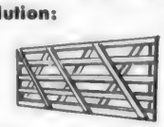

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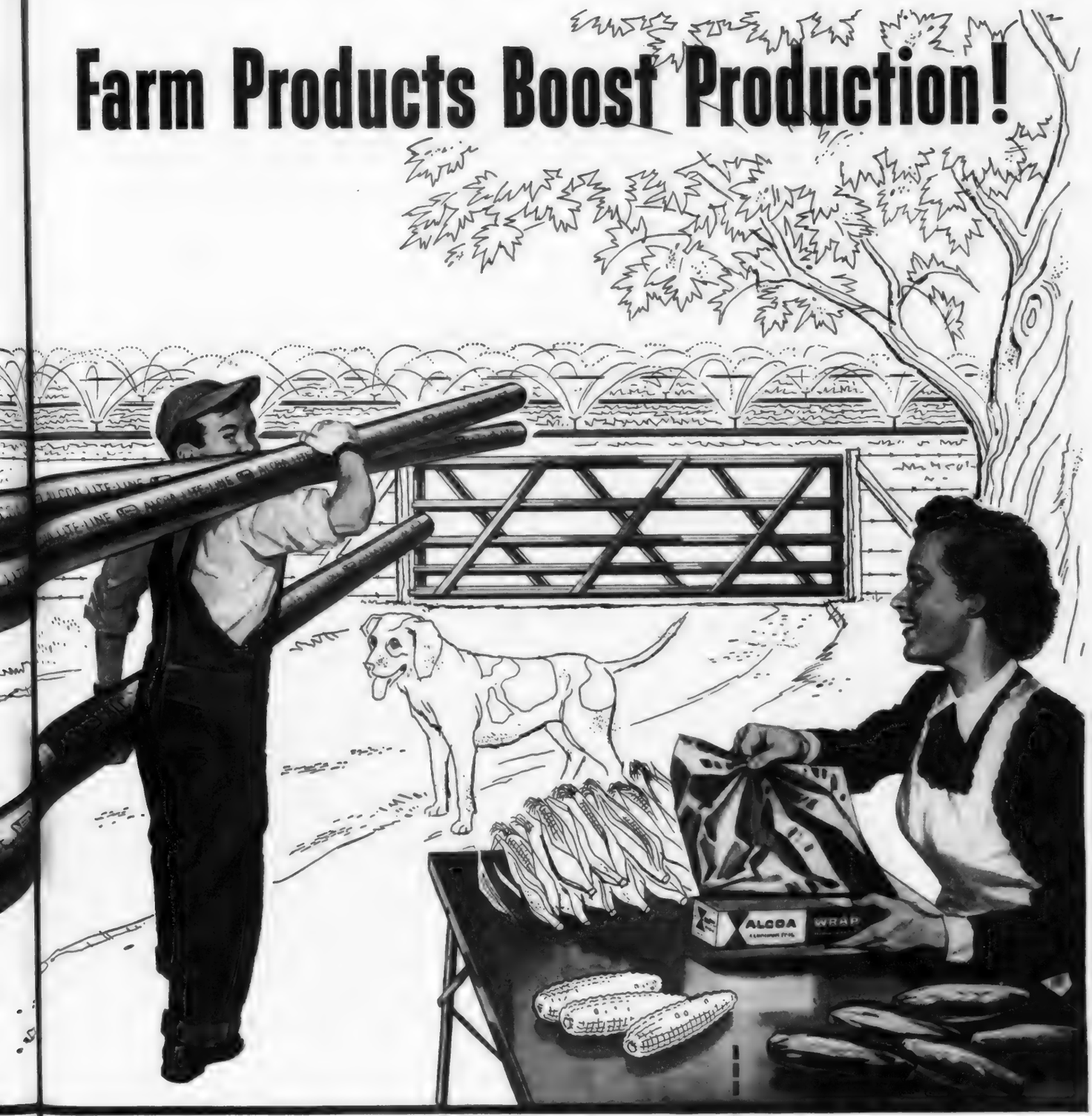

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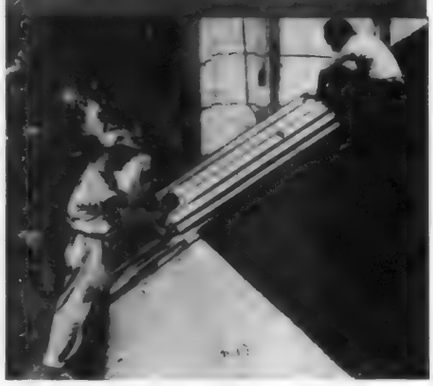

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No other roofing is so easy to handle. Rolls on like a rug. Predetermined lap-lines printed on rolls for perfect alignment. You save money on high priced labor.

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There are no side laps for wind or rain to whip under. Stays on, even in a hurricane. Quaker State Aluminum is rust-resistant, requires no painting. You save money by eliminating maintenance costs.

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With QSM Aluminum Roofing in Rolls, you buy only what you need. Available in 2 widths, 28 and 48 inches, and in 50 and 100 foot rolls. You cut to exact length of roof and save money by eliminating waste.

* Ochiltree Patent No. 2,369,487

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most honey markets. A 13 to 15 ounce comb of honey sells for about 50 cents, whereas the same amount of strained honey would sell for a quarter of that price.

The Bee Associations

Beekeepers of America are bound loosely together by the National Beekeepers Federation. This association looks after the general national welfare of the beekeepers and publishes a magazine. Each state has its own association. In California there are two associations. The California State Beekeepers Association looks after the interests of beekeepers at the state capitol. A second association, The California Bee Breeders Association, is of more practical help in raising and marketing bees. For example, The Bee Breeders Association purchased the patents, and now manufactures the packages used in shipping queens. These are sold under a cooperative arrangement. Other bee supplies and services are furnished by this association.

FOREST POOL

(*Continued from page* 69)

ered most of the open water. What little remained was green with algal scum.

Long after the fire a settler drove his team over one of the old logging roads to the site of the big logging camp at the pool. In the wagon were an ax, a saw, a breaking-plow, and supplies. At the swamp hole he watered his horses and stood there remembering the pines as they looked when he had come in with the crew. One small building had escaped the fire. He moved into it and set to work clearing himself a farm. Day and night he labored, pulling stumps and burning the great piles of roots and brush and windfalls left from the logging and the fire. Gradually a small field was broken to the plow.

As time went on, the little field grew larger and larger, but always in its center was the unsightly swamp hole, which defied all attempts at drainage—an ugly scar in his open clearing, a jungle of blackened and twisted roots interlaced with

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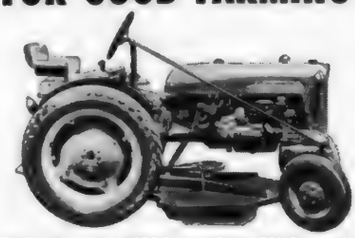

B. D. Harter of Oklahoma City, Oklahoma, has a Wood's 42-inch cut Rotary Mower-Shredder mounted on a Farmall Cub. And he says, "Have had no trouble with it—it's a necessary for good farming." That's because Wood's PTO-operated Rotaries shred stalks, brush, residues, prunings . . . cut small trees . . . mow grass, clip pasture . . . and mulch leaves. They do it faster, at lower cost, and with less maintenance than by other methods.

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42" under-mounted for Farmall Cub, Lo-Boy, Super A, 100, A-C G, M-H Pony and Pacer. 42" rear-mounted for Fast-Hitch Cub and Lo-Boy. 61" and 80" rear-mounted for Fast-Hitch Farmalls Super C, H, M, 200, 300, 400, I-300 (all use 3 pt. adapter), and all standard 3-point hitch tractors (Ford, Ferguson, Oliver Super 55, etc.). 61", 80", and 114" drawbar pull-types for any 2, 2-3 and 3-4 plow tractors. 80" offset model (2-3 plow) for working under trees. All have free-swinging, quick-detachable blades.

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Lightning Protection in the Modern Manner

15 Tons More Silage Per Acre!

Ample Feed Assured For 225 Cows

IN EARLY 1955, Paul Harber and Dan Holliday decided to try sprinkler irrigation on their dairy farm in Jenks, Oklahoma. They were growing honey-dip cane, alfalfa, corn and hygera and getting yields of 10 tons per acre. After the installation of two irrigation systems was made by Diesel Power Co. of Tulsa, Oklahoma, their yields were increased to 25 tons per acre, assuring ample feed for their herd. In 1956, three more Marlow pump-equipped systems were installed.

Water for the systems is pumped from sand points by five Marlow 6-inch self-primers which were used because air is sometimes drawn on sand point pumping. These pumps prime *automatically* and can operate unattended. These units pump water to irrigate the entire 400-acre farm.

For complete information on Marlow Sprinkler irrigation pumps write for literature and the name of your Marlow Dealer.

This skid-mounted Marlow self-primer, pumping from sand points, is permanently located in a pit.

Portable Marlow self-primers are moved from one pumping location to another as needed.

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Urea is a natural for low-cost production of meat and milk. High-quality balanced feeds, containing this quick source of protein, speed up rumen activity to help animals get the greatest feed value out of roughage.

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The true economy supplements to roughage are well-balanced feeds containing oilmeals, urea, minerals, vitamins and energy feedstuffs. Farmers, feeders and ranchers everywhere are using mixed feeds containing PROCADIAN* Urea because these better, low-cost supplements pay off in more meat and milk.

Ever since the first cattle and sheep grazed on wild plants, these ruminant animals have been getting some of their protein in the form of urea. Oats, alfalfa, oilmeals and many other natural feedstuffs have always contained some urea as a part of their protein. When your feed manufacturer uses PROCADIAN Urea in balanced concentrates, you get this additional source of low-cost protein to help build bigger feeding profits. For economy and quality—look for UREA on your feed tag. *Trade-mark

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briars and alder. Because the pool bred mosquitoes, he built a new cabin on a hillside at the far edge of the field.

One day while he was working there, one of the horses wandered back to the swamp hole to crop the sedge, which was greener there than anywhere else. The animal went too close to the edge of the water, broke through the layer of muskeg which had almost overgrown it, became hopelessly mired, sank deeper and deeper into the muck. When the settler came, the horse was dead.

That day he built a rail fence around the pool and rode the other horse to town for a box of dynamite. He knew what he must do: blast the layer of hardpan that lay beneath so the water could drain away.

In the fall when the swamp hole was dry, he dug down through the black peat, tamped in a charge of explosive, and lit the fuse. With a roar the blast went off and the swamp hole seemed to lift; roots and earth and stones mushroomed high into the air to fall again into the hole from which they had come. After that it was quiet and the air was acrid with the smell of burnt powder. The settler picked up a caribou horn that was golden-brown and in places blackened with age, and nailed it above the door of his cabin across the clearing.

The following spring the shining blade of the breaking-plow cut into the bottom of the little marsh, tearing through what was left of the ancient rim of sphagnum and the game trails that could still be

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Authorized McDowell Dealers Offer
The Original, Automatic, Pressure-Lock Coupling!

If you're interested in portable sprinkler irrigation that works better with less work *and less upkeep*, it will pay you to see your McDowell dealer. He not only offers you the best coupling made, but he also has the experience to engineer and install for you a complete irrigation system that's best suited to your needs and your finances.

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Your choice of 3 Mechanized Lateral Moving methods (2 by Tractor, 1 Self-Powered) that move up to ¼-Mile of Lateral as a Unit . . . without work! Saves Handling . . . Saves Time!

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Tractor moves Sprinkler Line laterally without going through Crops . . . revolutionary, patented, automatic "Shifting Wheels" is the secret.

POWER-ROLL
Lateral Line rolls across the field to new Irrigating position...Engine Driven! One-Man Operaton. New power and strength handles rolling fields and adverse field conditions.

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Trails Directly behind Tractor. Ends Hand Moving...moves Complete Line in minutes to new Irrigating position. Speeds moving from field to field.

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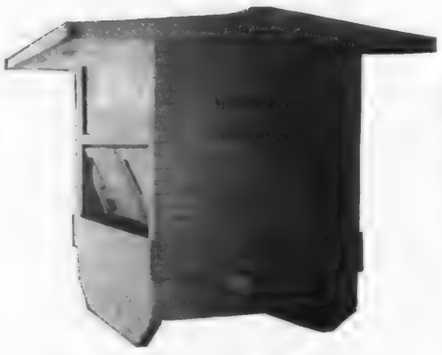

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dimly seen, trails that had been followed since the retreat of the glaciers to the north. Now for the first time furrows ran straight across the field. That summer the clearing was planted to corn, and when the crop was grown, it was hard to tell where the forest pool had been except that the stalks were taller and greener.

One night when the moon was full the settler walked out to the center of his field and stood there listening to the rustling of his corn. Now the whole field belonged to him and there was no longer the smell of the swamp, no longer anything to remind him of the cold wilderness. It was even hard to remember how it had looked when the logging crews moved in. That had been a different world. Now the air was rich with the scent of sweet clover and ripening corn. From the hillside beyond shone the lights of home, and he heard the soft tinkle of a cowbell in the pasture back of the barn.

But as he stood there a great horned owl hooted back in the woods, and for a moment the ancient scene returned. Again the pool was there with its rim of pointed spruce and the tall pines. There was a hint of sphagnum and resin in the night air and the pool was silvered under the moon. Then just as swiftly the vision was gone. The corn rustled softly and the tinkling bell in the pasture was very clear.

DOES MULTIPLE FARROWING PAY?

(*Continued from page* 45)

troughs, and put up some more fencing. One day a neighbor and I were talking about a comparison of present-day equipment costs between two farrowings and several farrowings a year. I figured I have $5,938 invested in hog equipment aside from the cost of heavy implements or regular fencing. Look at this list and you'll see it doesn't make much difference whether I have two farrowings a year, or several; my equipment costs will remain about the same. With this kind of investment you can't afford to have anything standing idle."

10 water fountains	$ 450.00
6 automatic waterers to hogs on concrete slab	150.00
3 all-weather water tanks	180.00
40 hog coops	2,200.00
6 hog feeders	540.00
9 water hydrants	198.00
8 large movable shelters	1,200.00
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200 rods fence	180.00
200 iron posts	200.00
4 wooden platforms for water tanks and feeders	80.00
Water hose	20.00
1500 ft. pipe to fields	300.00
	$5,938.00

McMechan says he is doing a better job of hog raising using multiple farrowing. On a test of 54 sows he weaned an average of 9.1 pigs, a record for him. However, his usual figure is 8.6 pigs weaned. He feels both his cost and labor per pig are much lower since using this system of year-round volume production. "In fact," he said, "during the summer I put in less time on hogs than a lot of men with the two litter operation. This multiple system spreads my work over the entire year.

"Now I don't want to leave the impression that there is no work connected with this type of operation. Nothing could be farther from the truth. There is a lot of work, but it is spread over the entire year. Just on hogs alone, we average about four hours of work a day, seven days a week, every single day of the year. There's no off-season here. During the warm season I have a hired hand, but during the other six months my son Jimmy, who is 16 and a junior in high school, and I manage the operation. I should add that the women of the family get their share of the work, too. My wife, Roberta, has to do a lot of my regular work during corn-picking time, and Joy is to the age now where she can watch the filling of water tanks.

"During the school year much of our work has to revolve around Jimmy's week-ends and holidays. Even so, he sure is a big help. He gets out of bed at 5:30 every morning and puts in an hour and a half of work before school. After classes he again puts in another hour and a half of work.

"Every day we check all the water tanks and feeders, and take a good look at the hogs. Even though it is time-consuming, this daily inspection of the hogs is worthwhile. A few years ago I neglected to check the stock for a couple of days during corn-picking time. When I did, I found 16 dead hogs; erysipelas had

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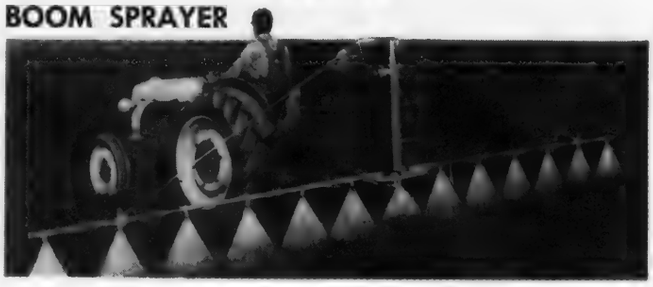

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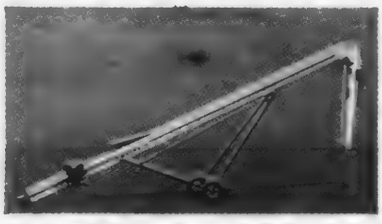

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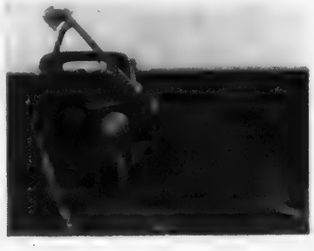

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set in. Luckily, I was able to start treating in time and lost no more, but now one of us takes a close look at the hogs every day of the year."

Corn-picking time is the busiest season of the year on the McMechan farm. During corn picking the day starts at 5:00 a.m. and often goes for 16 hours or more.

Every farmer has his own system of feeding, and McMechan is no exception. Each group of pigs is kept in a three or four-acre lot, with their sows. These small pastures not only help regulate the breeding program, but also make it easier for the pigs to stay with the sows. He vaccinates at seven weeks and weans at nine weeks. Then the cycle starts over again.

Portable coops or houses are either lined in a row, or grouped in a half square arrangement in each lot, depending on the layout of the field. Feeders and waterers are next to each housing area. Each area has a feed bin placed near it where sacks of feed are stored. While on the daily inspection tour, the feeders are filled from the nearest bin. To keep the sows out of the pigs' feed, a creep is built around the self-feeder, and the sows eat from a trough or pan. McMechan starts his pigs with a creeper feed, then moves into a starter that is fed past the weaning age of nine weeks. Next comes shell corn with the starter for a couple of weeks, and then the fattening ration. In winter he uses more ground feed so that he can better utilize the feeders. This winter ration has a lot of alfalfa meal in it to prevent constipation. Because of an acreage allotment on wheat, McMechan raises some oats, which he uses in the sow's ration; but the "lifesavers," as McMechan calls them, are the portable corn cribs which the fattening hogs empty themselves.

"Winter presents additional problems for this operation," said McMechan. "By feeding a good balanced ration to the sows I've been able to get good-sized pigs. Pigs around three pounds don't have much trouble during the winter, but a runty one is a money loser from the start. But the two big problems during winter are to prevent freezing of the water supply, and keeping the pigs dry. I've had good luck with the water by using Celian double lined water tanks that are equipped with either a coal-oil burner or an electric heater. I don't have any electric lines to my fields, so I use the coal-oil

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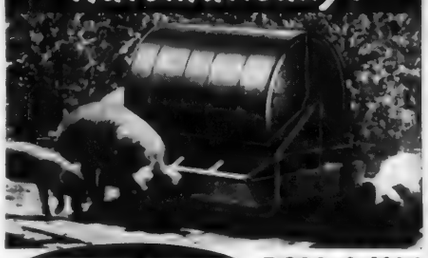

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burner. It takes work checking all these things but I have had no trouble with my water system. To keep the pigs dry I use corn cobs by the tons. Around the housing, feeder, water, and crib areas I spread thick layers of cobs. When an area shows signs of moisture, on go more cobs. Because these cobs get thick in some places, I spread them around the field with the tractor scoop before plowing them under in the spring. Once in a while, the local mill will temporarily run short of cobs, so I keep a wagon loaded with the cobs throughout the entire winter. Should a sudden wet season set in, I'm not caught short."

During the winter McMechan makes good use of the concrete feeding floor in the barn, and behind it. On this floor he uses the same kind of portable, self-emptying cribs that he uses in the pasture, and cobs are also utilized to control moisture.

McMechan is always looking for a better way to do a job. It takes a lot of work to truck mixed feed from the local mill to the farm, and then haul it in sacks to various lots. He is now negotiating for a portable feed mixer that he hopes will eliminate a lot of the labor that goes into lifting feed sacks. He plans to buy a lot of his feed in bulk and do his own mixing. This mixer can then be pulled up to each feeder while on the daily inspection tour, and an auger will deliver feed from the mixer to the feeder. This operation will eliminate the field storing of sacked feed in the portable bins.

Last fall McMechan's corn yielded 100 bushels to the acre. But, in one field

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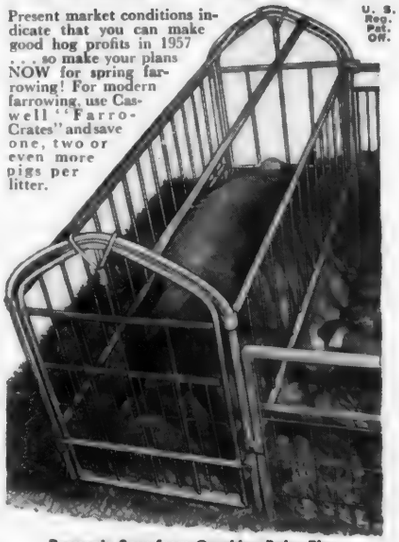

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where he planned to put in rye, the wind elbowed the corn. Not one to be counted out, he had the 30-acre field sowed in rye from an airplane. This is what he means when he says, "You have to be elastic."

Another Indiana farmer, Wilbur Fields, who operates a 190-acre farm with his son, Ray, in Fayette County, had this to say about his multiple farrowing operation. "A couple of years ago Ray and I decided that we were going to have to specialize if we were to stay in the farming business. Our overhead was getting too high, we were hitting low markets, and we couldn't utilize our equipment to best advantage. We formerly had a general farming operation—some beef cattle, hogs, 18 milk cows, cash grain crops, and so forth. But we decided to go all the way on hogs. Today, the only animals on the place are swine.

"For $50 we converted a 28 foot by 32 foot concrete block calf shed to a central farrowing house. We got some old grain-bin cylinders, cut them in half and made quonset-type hogs coops from them. We bought a few more feeders, some heat lamps, and we were in the hog business.

"We got into this system about a year and a half ago, starting with 24 sows. We had four sets of farrowings the first year, but we plan to eventually increase our sow herd to 50 and have farrowings every month. We started with four farrowings because the breeding of our replacement gilts seemed to best fit this pattern.

"We operated this four-a-year system by having farrowings about January 1, April 1, July 1, and October 1. We market hogs weighing 210 pounds at six months of age.

"Because of fewer number at a time, we find that we can keep a better eye on our stock and turn out a better quality hog. We topped the market every time we sold hogs last year, once for a 35-cent premium. When I hear fellows talk about receiving $12 or $13 for all their hogs last year, I just look at my marketing record and say, 'Sure we received a low of $12 for some of our hogs, but we received a high of $18 for some of the others, for a yearly average of $15.10 on 400 hogs. We don't figure to hit all the high markets, but we certainly won't hit all the low ones either. No twice a year farrowing for me.' "

Most other multiple farrowing men handle their sows and pigs the same as Fields; namely, keeping each bunch of sows and pigs separated. This not only helps keep the breeding program in order, but also gets the pigs off to a better start because the small pigs don't have to battle larger ones at the feeder. After he gets some size on the pigs he finds he can mix 80-pound pigs with 120 pounders without anv trouble.

The effect of earlier farrowing of both spring and fall pigs during the past several years has not done as much as some people assume toward doing away with the peaks and valleys of hog marketing receipts, and the corresponding fluctuations in hog prices. The marketing peaks and valleys are not quite as sharp as they were a few years ago, but nevertheless, we still have the seasonal gluts and shortages.

Packing-house officials across the country say that multiple farrowing could be the shot in the arm that the whole pork industry needs. The decline in recent years in the per capita consumption of pork can be partially attributed to the fluctuations in pork supplies. When a customer quits buying bacon for breakfast because of the seasonally high retail price, the whole

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see page 156

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industry suffers. Once a customer has changed his eating habit, say the packing people, it takes a lot of promotion and attractive pricing to make him a pork eater again.

The biggest disadvantage of the twice a year method of hog farrowing is that it upsets and creates extra costs throughout the entire phase of livestock and meat marketing. Packing plant work crews are guaranteed 36-hours pay if they are not cut from the gang on Monday. From both a humane and business point of view, the hiring, firing, and rehiring of packing house workers is bad. Many packers pay thousands upon thousands of dollars each year for unworked time during periods of short hog supplies just to keep their work gangs together. Then, when hog receipts overflow, gangs often put in a good deal of overtime, at time-and-one-half or double time pay. Many packing houses process 40 per cent of their yearly hog volume within a three and a half month period.

Several survey records reveal that the man who markets hogs throughout the years is going to have a higher average price for his livestock, because he is bound to hit some of the better markets in a year's time. The marketing records of Walter McMechan and Wilbur Fields bear this out.

Advantages of Multiple Farrowing: 1. Produces a higher yearly *average* hog price. 2. Specialization without seasonal markets. 3. More volume on same unit of land with same number of men. 4. Less cost and less labor per pig on a volume basis. 5. Constant utilization of equipment. 6. More able to experiment with different ideas. 7. Year-round labor utilization. 8. No need to try to outguess next fall's market.

Disadvantages of Multiple Farrowing: 1. Requires extra planning to work into a general farming operation. 2. Requires work and observation 365 days a year. 3. Requires an all-weather water system. 4. Requires separation of each bunch of pigs and more fencing. 5. Requires a rigid sanitation policy. 6. Requires skill and flexibility to maintain orderly breeding.

Most multiple farrowing hog raisers say that it costs little or nothing to make the conversion from the two-a-year system to the multiple system, if you already have a concrete feeding floor and a good-water system. In areas where weather conditions make a central farrowing house a necessity for year-round production then this is an added cost.

As for the returns, all Walter McMechan is willing to say is, "Since changing to this new system, I've noticed that Uncle Sam takes a much bigger bite at the end of the year than he used to."

THE AUTHOR: John F. Hughes is a city boy who turned to agriculture. He was born in Cincinnati, but spent his summers on his uncle's farm and then majored in animal husbandry at Ohio State University. His job as a hog buyer for the E. Kahn Sons Packing Company keeps him in close touch with the marketing problems of the livestock man.

HOW TO DOUBLE THE COUNTY AVERAGE

(*Continued from page* 48)

spots altogether, he is able to use the lime to best advantage and avoid wasting any on land that doesn't need it.

Another part of the report which Henderson accepted with little change was the recommendations on crops for the different soils of the farm and the rotations that should be followed. That part of the report dealing with seedings — pasture mixes, seed varieties, and the like — is also one that is frequently reviewed.

The second report, dated 1944, was filled with such war-time adivce as, "The fertilizer attachment for the corn should be ordered as soon as possible as only a few of them will be made this year," and "Temporary plates (for the corn planter) can be made of press board if no new metal plates can be had." Practical as this advice may have been at the time, it still leaves the question unanswered as to why, if the first report were really sound, should there have been a need for Henderson putting out good cash for a second report at all; or why the report should be repeated every five years.

The answer is that each report has carried the important in-

ventory of soil fertility; and each has brought the information regarding the latest fertilizer practices, seedings, feed handling methods; but most important of all, each report has given Henderson and the workers at the Clinic a chance to review the records which were made under the plan and to modify or refine the over-all plan for the next period.

In 1944, for example, wheat was practically eliminated from the rotation and even greater emphasis was placed on grass land. In 1950, the major change was an overhaul of the rotation to work out what was basically a three-year rotation altered to serve for nine years. This was done by grouping the corn years and the years of oats and leaving the land in sod for three years — in this way saving the cost of three seedings, insuring against bloat by giving the grass a better chance to get established, improving the tilth of the soil by getting more humus into the soil than would be put in by three separate legume and grass crops, and sneaking in a cash crop of beans in place of oats.

In 1956 the report again made an inventory of the soil wealth as well as the livestock and crop resources. Recommendations included an increase in the amount of potash to be put on the land — for some reason, the potash has not kept up with the other plant nutrients; the Clinic also noted that livestock utilization of grass was not keeping up with forage production and again recommended increasing both cattle and hogs. They were perfectly aware that, as in the past, Henderson will consider their recommendations and will probably go right on with 100 calves a year and increase the number of hogs.

The fertility and tilth that Henderson has been able to build into his soil through his planned operation was dramatically shown last year when his crop was compared with a neighbor's who is on a straight corn rotation. The neighbor, who regularly applies 600 pounds of fertilizer to the acre, harvested an average of 110 bu., while Henderson, who on a corn and soybean rotation averages 300 pounds of fertilizer a year, harvested 137.4 bu.

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"Portable Sprinkler Irrigation is very definitely a must in our orchard", says C. E. Dutton of Milford Center, Ohio. He has irrigated for 21 years. He says, "Several seasons ago we purchased aluminum pipe and sprinklers. We have found this to be the best method of distribution we have ever used". He adds, "we find that both apples and peaches respond equally well".

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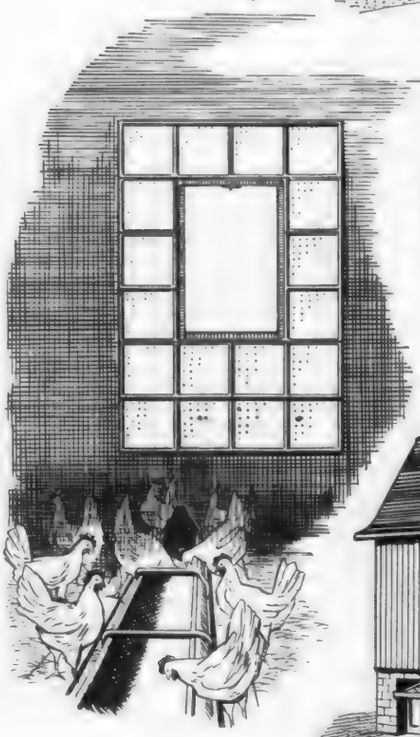

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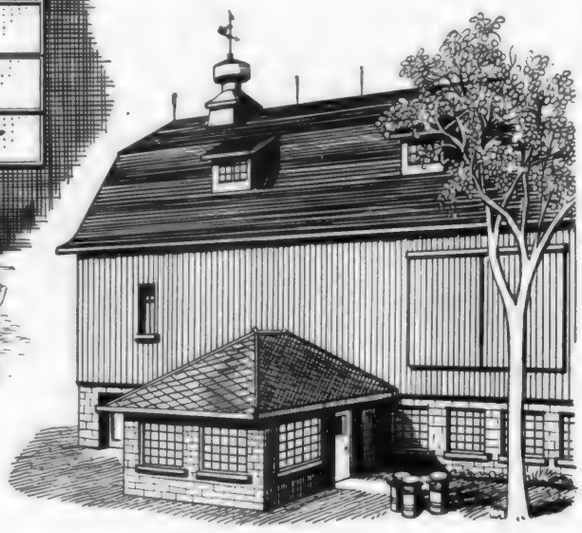

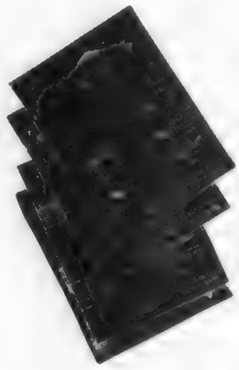

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Henderson believes very strongly that he has been able to store up more than just the excess chemicals he has put onto the land in the form of fertilizer. The heavier crop of corn and the long-term emphasis on a grass and legume program have built up the humus and the microbiological life of the soil. And, perhaps even more important, the deep-rooted plants have been mining the subsoil of plant nutrients. These plant foods, drawn from the lower reaches of the soil, are then combined into the tissue of the plant and deposited, in the form of humus, into the top soil where they are available for shallower-rooted plants.

Another example of the present fertility of the land is that Henderson is able to get by with about half the supplement that other hog raisers use simply because of the greater nutritional quality of his corn. And his pasture is so high in protein that his cattle came down with what his veterinarian described as protein poisoning. "The University may say there is no such thing as protein poisoning," Henderson says, "but just let me tell you how we cured it. We cured it by putting a few bunkers out in the pastures and feeding crushed corn cobs. And the animals just wolfed them—dry corn cobs with no molasses. And the combination of cobs and pasture stopped the protein sickness. It seems to me to prove that they *were* getting too much protein from the grass."

But the example of the fertility of the land that Henderson likes best occurred last year when he asked a neighbor with a mounted corn picker to come in and open his fields for him. "He asked me what the crop would make," Henderson said, "and I told him it would go over a hundred. 'I doubt it,' he said. I've never seen a hundred-bushel crop, though I've heard lots of guys talk about them.' I said, 'O. K. but be sure your equipment is in good shape.' He said, 'I'll tell you what Alfred, if you go over a hundred, I'll do the job for nothing.' Well, he came over a couple of days later and started on the field behind the house here. I saw him stop a couple of times on the far side, so I walked out to see what was holding him up. He said, 'I just don't seem to have the capacity, Alfred.' When he finally finished the three fields, he came over to the house and all he said was 'No Charge.' Then he looked real pitiful and said, 'You'd give a fellow enough gas to get home on, hey Alfred?'"

There are soils problems which have only become apparent with the exact record keeping over the years; these are problems which will take a considerable amount of scientific research to solve. One, for example, is why, after years of liming the soil according to the best recommendations, the pH remains low. Another such problem came up in connection with the new rotation. After leaving land in sod crops for three years, they plowed it up for corn. They are still wondering whether it was a coincidence or

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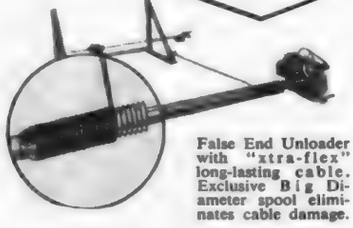

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whether there is a strong connection between the rotation and the fact that in each of the fields that had been in sod for three years the crop suffered from smut, which did not affect their other corn.

But, the problem that really has them puzzled is the response of the soil to fertilizer. It has always been assumed that if all the fertility needs of the soil are met, the yield will increase until it is limited by some other factor such as moisture or the inherent ability of the plant to produce. Now Henderson finds in separate tests in different years that adding more than the usual amount of fertilizer to his corn *decreases* the yields. Why? No one yet knows, but Henderson knows that last spring they put down the usual 100 pounds of 0-20-20 between the rows of corn on most of their land and then added an extra 100 pounds of the same fertilizer on some of it and an extra 200 pounds on some more. In the fall, M. L. Smith, Henderson's nephew who is being groomed to take over the farm some day, made careful measurements to check the results. "It was easy to tell where we had put the extra fertilizer," Smith said. "The extra 100 pounds had reduced the yield and the extra 200 pounds had reduced it still more. We have found that the same results follow from adding nitrogen, but we don't know why. Our guess is that we have achieved a nice ballance between fertility, humus, and microbiological life in the soil and that the extra fertilizer is throwing it out of kilter."

With production apparently reaching its upper limit, one wonders where long-range planning goes from here. Allman and Yaw feel, and Henderson agrees, that there are four major jobs for the Farm Clinic at this stage of the game. The gains which have been made must be protected. They must consider and weigh economically the major changes, such as irrigation, which could still boost production. They must constantly be on the alert for any scientific developments which will apply to this farm, such as an explanation of their fertilizer riddles. And they will continue to make their soil invetories and to gather all of the facts needed for planning the operation of this farm. For as someone once said, "A farm plan is only as good as the information on which it is based."

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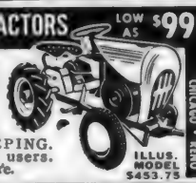

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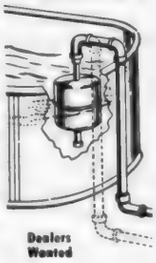

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THE FARM GIRL

(*Continued from page* 51)

"Oh, Roger, we'll have to open it and see if I *have* my bathing suit."

In the barnyard below, Frank Carnes, the school bus driver, was helping himself to free gasoline. It was his idea of getting cooperation from the kids, and especially their dads; whenever he had to wait more than five minutes he always pulled five gallons of gas out of the farm tank.

Inside the bus were seven boys and six girls who had already been collected for the trip. The girls were dressed mostly in pleated skirts, pastel cashmere sweaters, and saddle oxfords. The boys were in the standard jeans and sweatshirts, each with a large block "A" in tufted red sewed to it. There were various grades of "A", though, indicating the relative popularity of the various sports at Alton Consolidated High School. Baseball was 10 inches high, track was 12 inches and basketball was a towering 15 inches. Elmore Hance, the Agriculture Practices teacher and FFA advisor, had attempted to get singing started several times, but even the "Yellow Rose of Texas" received only limpid attention.

The usual small talk of a morning round-up for school was missing. The nervous excitement of anticipation of the trip had given away to the hard work of getting under way. Mostly, though, the fact that Susie Gaskins was crying when she climbed up the steps had tempered the occasion. When she had refused to sit with Wayne Corbin, everyone knew that she really wasn't his girl. Her eyes roamed from building to building and stopped at each window in the house to see if Roger was looking out.

Then the kitchen door burst open with battering ram action as Roger pushed his mother's suitcase ahead of him. He used it as a counterbalance for a large cardboard box that he carried in his other hand. "Careful, Roger, those cakes and pies have to be kept rightside up," his mother's voice cautioned from the depths of the kitchen. Then she went over the details of bachelor living for her husband. "Cousin Ella is expecting you and Roger at six o'clock every night for supper. Albert's wife will come over from the tenant house every morning and wash up your breakfast dishes. Then you'll have to go over there and eat your lunch at noon every day."

Now, everyone was aboard and Frank Carnes gunned the motor for an extra show of power. With a tremendous lurch, the bus leaped into motion, but the direction was wrong. It went backward instead of forward. With a crunching noise the wheels flattened a half-built hog house. The passengers in the bus alternated between laughter and screams, depending on their sex. When the bus stopped, it had sheared the cloth top neatly off Roger's '44 roadster.

Roger's face fell with his arms, and he let out a low moan. Frank Carnes leaped out of the bus and glared at the car and the hog house. "It shouldn't have been parked there," was all he could say. Elmore Hance surveyed the damage, straightened his tie as he always did before making an announcement to the morning assembly then said, "We will have to see what the insurance company has to say about this."

It remained for Susie to bring action back to the scene. "You get that big bus off Roger's roadster," she ordered Frank Carnes. "Now, please, everyone get back in the bus and get started to Florida. It's a long drive and you are late already. I can't possibly go now. Someone has to help Roger get his car fixed and I will take the responsibility for the entire Chapter. How can a man ever be expected to sew up that top?"

After a short attempt at persuasion, Elmore Hance climbed aboard, and, with a down-the-road wave of his hand, said, "Talk about mules being stubborn . . . "

"Don't stand and look at it now, Roger, we'll work on it after supper," Susie shouted over the roar of the departing bus. "Please catch a couple of those roosters. I'm going to fix a fried chicken lunch for you and your Dad."

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MOUNTAIN WOMAN

(*Continued from page* 85)

with his mule, snaking the logs down to the river and then when the spring freshets came, floating them to the mill at the railroad, twelve miles away. He added a lean-to kitchen to the house and covered the logs with clapboards. He cleared a little more land on the hill, put in more corn. When he had enough extra to make a run of corn whiskey he and two of his neighbors bought a length of copper tubing and set up a still in a dead-end hollow near a spring. Working at night so that the smoke would not give them away, they jugged the clear moonshine and brought it down to their cabins.

"We all took a sip in the morning and just before we went to bed," Martha recalls. "The kids too—and we never had any colds or rheumatics or stomach trouble."

For many years John made his own shine, unmolested and untroubled. It was like a crop, a part of the family diet. Sometimes he sold a little or traded some to a neighbor who was short. But he wasn't in the business and he couldn't understand why you couldn't make your own beverage the same as you could grow your own corn for meal. After a while the revenuers came. They snooped around, arrested a neighbor up the Branch and discouraged John.

"They never did catch my man," says Martha. "He traded off his worm and bought his shine. You could get a jug full for a quarter in those days. I'd like to have some regular, but they put lye in the stuff they make now, and we don't drink it any more. They take it to Cincinnati where they'll drink anything."

As long as the mountain people made moonshine for home consumption, the federal government took only an academic interest in the industry as an illegal venture. But when it began to compete with licensed distillers, the revenue men moved in and brought with them an era of raids, sabotage, and spying. The "revenooers," disguised as itinerant preachers, peddlers, and hardware salesmen, ferreted out the stills, fought pitched battles, and sent those they caught away to jails outside. The long campaign against illicit liquor-making became epic; ballads were writ-

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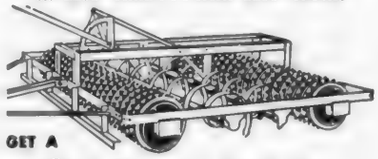

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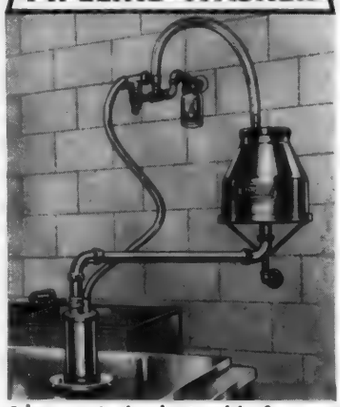

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ten and sung to the accompaniment of the favorite mountain instrument, the guitar. The hero was the one who frustrated the revenuers, hiding his still so skillfully and shooting so straight that he remained free.

Shoes were the biggest clothing problem for the growing family. Martha's uncle was a shoemaker, but he lived at Indian Bottom, a good day's travel from Spring Branch. Once a year John loaded his family on the mud-sled and with two calf hides he had tanned himself, paid Uncle Hugh Dixon a weekend visit. Uncle Hugh took the boot sizes of the family and a month later the work was done. A pair of boots lasted a year or more. They were boots, not shoes, and sometimes as a special favor Uncle Hugh put on copper toe-plates for the boys.

The children attended school at Jeremiah, a village two miles from their cabin. If they managed three or four days a week they did well. Often in winter the hill trails were too difficult, and in the spring and fall they missed whole weeks, helping with the farm work. Truant officers and school buses were unknown to them, and if they acquired a working acquaintance with the three R's at the end of their short school life, they were contented. There were few who knew more than how to "cipher" and spell out of the Bible.

They learned more on the mountain and in the fields than they did from the teacher. As soon as they were old enough to walk they scoured the mountains for nuts in the fall, sassafras root in the spring; they gathered blackberries, wild grapes, paw paws and "poke greens," a salad made with dandelions, poke weed and water cress. They trapped and hunted small game at all seasons. They held the wicks while their mother poured the candles and carried the lead pot from the fire when their father poured the bullets for his long rifle. They learned to shoot straight and fear strangers and how to fight "rough and tumble." They joined their elders in a dipper of moonshine before bedtime. Those that survived were tough and resourceful. They became self-sufficient like their parents; they knew how to endure privation, how to "git along."

This was the way of life for a hundred years after the wild game had vanished, and a living had to come out of the thin soil. No new blood came in, for the soil was giving up its maximum, and would support no more. A young man went to the cabin up the branch for his bride; when his children were ready for marriage, they too went up the branch. It was easier than walking miles, all up-hill, to the next branch to court a girl who might ultimately refuse the honor, or whose brother might take a shot at you because all strangers were suspect. So there was inbreeding from the start; today everybody is a cousin, and the same old-English names of Adams and Collins and Caudill crop up all over the Tennessee and Kentucky mountains. The inbreeding produced an annual crop of idiots, and undernourishment contributed much to the decline of the stock. By the turn of the nineteenth century the Kentucky and Tennessee mountaineers were tagged with a stigma—they were hill-billies, and hill-billy is not a complimentary name. They settled into a pattern, tall, lean, hawk-nosed, thin-haired, stooped, and they talked with a drawl in a language which smacked of Chaucer and the King James Bible.

The long rifle was the law. If your neighbor stole your pig or violated your daughter, you took your squirrel gun off the mantle and went gunning for him. Family feuds went on into the third and fourth generations—the Hatfields and the McCoys exterminated each other. Breathitt County was known through the land as Bloody Breathitt; it was indeed a foolhardy stranger who allowed the sun to set on him in the Breathitt mountain.

Martha does not like to talk of those years, and the privations of her family. "It was easier for my grandfather," she says. "He could shoot the winter meat in one day on the mountain."

Many of the old arts of self-sufficiency had been lost; no longer would mountain people spend weeks at the salt licks. No longer were young girls willing to sit hour after hour at a loom, weaving the cloth for the family. Those things that must be bought cost more, and the list of those things one wanted grew faster than the means to buy them. As the new way of life pushed in from

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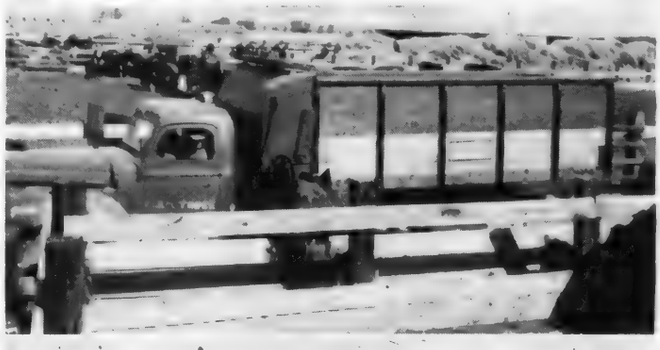

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the outside world, the young people went north to the cities, for their home hills offered them less and less. When a cabin burned it was not rebuilt; hillside cornfields went back to briars and weeds. The mountains were losing their people.

In 1910 the railroad came. John Back got a job laying track and later when the mines opened he became a miner. The hours were long and the pay low, but it did bring in cash. Coffee replaced sassafras tea as a hot beverage and brown cane sugar took the place of sorghum molasses. Martha remembers her first calico dress—and the first oranges John bought for the kids' Christmas.

But the money could never keep up with the children. Eight of them came along in twelve years. The four double beds just about filled the two rooms in the cabin, and ten hungry mouths had to be fed from the little corn patch and the kitchen garden. That calico dress lasted her for seven years for she wore it only to church and funerals.

No one could afford to be ill. The doctor was fourteen miles away and he charged fifty cents a mile, going and coming, for a visit. A midwife brought Martha's children and homemade potions and ointments had to take care of the day-to-day illnesses. One of the boys broke a leg and that cost them twenty-five dollars, which they were two years in paying. Bad teeth stayed in until one got the courage to have them pulled with a pair of pliers. One just wore out the measles and whooping cough and drank moonshine for all the common ailments. The weak died and the strong survived, all a little undernourished, a good deal overworked, and one was always tired. Life was serious, with no relief except the Sunday church, where the preacher scared you half out of your wits with his threats of hell fire and damnation. But there one could forget the hard life—let himself go; and the shouting and carrying on at the winter revival meetings were something to look forward to.

Martha Back is a Baptist, and an ardent one. Her great-grandfather brought a Bible in his saddlebags when he came north out of Carolina. Religion, as an emotional outlet, is strong in these hills. In the early 1800's a powerful evangelical group of Baptists in North Carolina undertook to bring the Bible to the "heathen" settlers in the Kentucky and Tennessee mountains. This was the Roaring River Baptist Church, and its missionaries prayed and baptized and exhorted their way into every nook and cranny of the mountains. The Baptist Church is predominant, the hard-shell, shouting Baptists who believe in instantaneous conversion, hell-fire and brimstone, and infant damnation.

The mountain people attend church as people of the cities attend the theatre or the races. It is their recreation, their promise of better things to come. During the annual winter revival meetings the coun-

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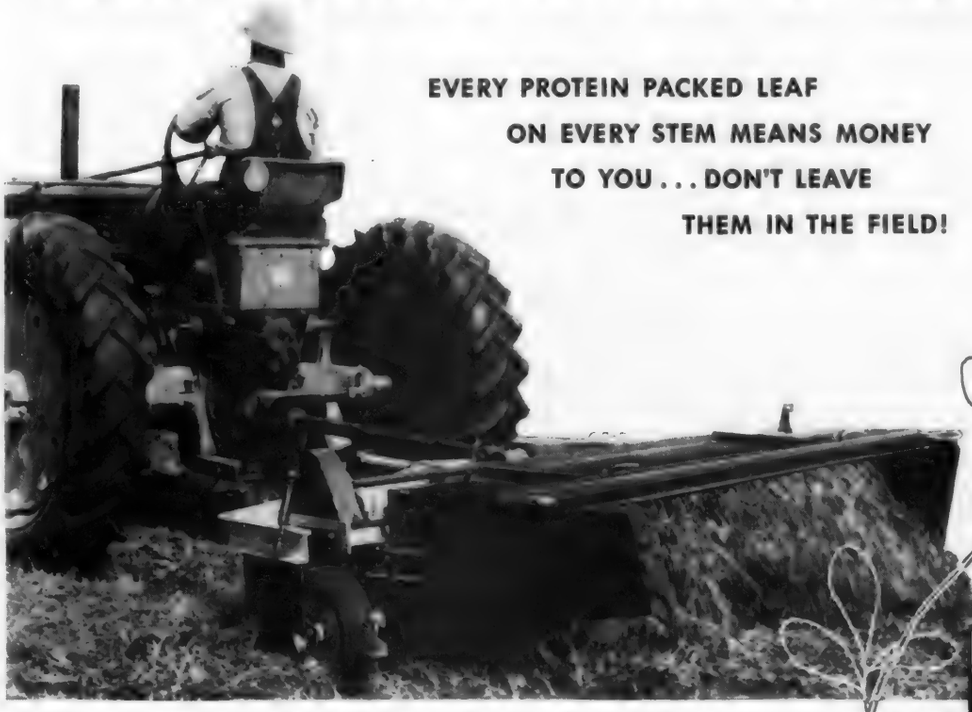

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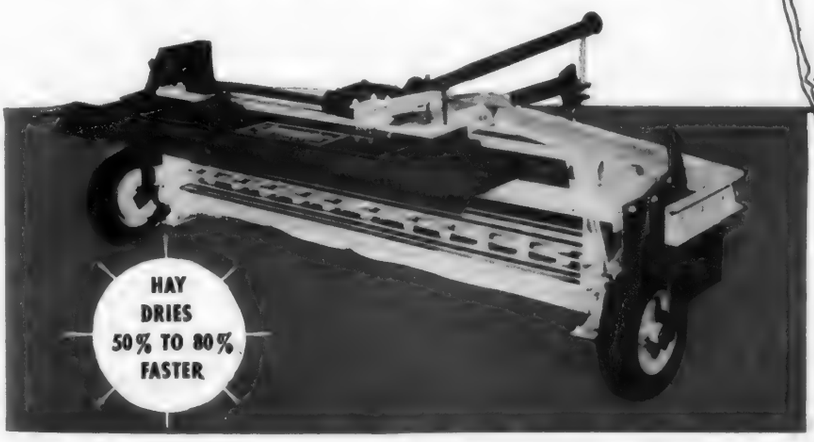

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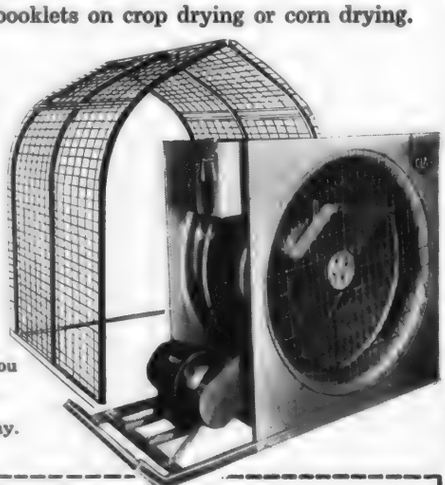

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tryside turns out for an emotional binge seven nights a week, attending meetings in their own and neighboring churches, walking miles over the mountain trails. They shout, are seized with frenzies, speak in unknown tongues. Preachers are measured by the volume of their exhortions, by the very violence of their appeal. The best are those who leave their audience trembling and terrified at the prospect of an eternity in hell. Many of them are adept at mass hypnotism; these are the prophets and leaders of the mountain people.

Martha never misses a meeting. Her church is one of the few remaining ties with the old way of life. That life may have been more difficult, but at least she was familiar with her problems then, and had her own way of solving them. She is ill-fitted for the new life of the juke box and store-boughten dresses and frozen foods. She accepts her old-age pension check, for she must live, but it violates all her age-old principles of self-reliance and independence. That is why Martha Back will never leave her tumbledown mountain home—until she joins her husband in the cemetery down the Branch.

"I've got a son in Indianapolis," she says, "and he has a good job and wants me to go live with him. But I just wouldn't know how to act up there. It's too flat and there's too many people."

VERTICAL MULCHING

(*Continued from page* 71)

on the rest. The dividing line was perfectly apparent on the surface of the field after two inches of rain had fallen—that part which had been chiseled to 20 inches without mulching was covered with standing water; on the other half of the field the mulching channels were drinking in all the water that came and there was none on the surface.

They then dug away the earth from a channel to show it in cross section. Free water was standing in the channel 12 inches below the surface. As the rain continued, the channels gradually filled, but none of the five inches of water escaped as surface runoff. The 20 inches along each side of the channel had provided 40 inches of surface for the water to penetrate and had created a passageway for the water to enter the soil and reach the more absorbent lower levels.

On a hot, muggy day in June of 1956, a one-inch shower fell on these plots. The rain came so fast that only the top two inches of soil were wet before the water began to run off. But no water was lost from the vertically mulched plots. Again a cross section was cut to see what was happening. The surplus surface water, which had run off the other plots, had been funnelled deep into the subsoil on the mulched plots where it had spread out. There, 12 to 18 inches below the surface, this water was available for growing crops.

With this same cross-section technique, they were able to study the different mulching materials they had used. The fresh sweet clover, they found, had first compacted far more than the straw and other dry mulch and had then decomposed to the point where it had almost disappeared after only four months. From these observations they drew one of their first conclusions—this system was not well adapted for putting down green manure.

The channels that had been mulched with straw, corn cobs, and trash were, even after a year in the ground, all that Spain had dreamed of when the idea first struck him. Plenty of mulch still remained in the cut to hold it open for another year, perhaps three or four; and a new development had taken place which excited him. With air penetration and plenty of mulch had come earthworms. They had honeycombed the sides of the channel, leaving the soil loose and crumbly with their castings. After examining the results of a single year of this activity, Spain is convinced that even after the mulch is all decayed or consumed by the worms, the activity of the earthworms will have stabilized the channel area into a porous, absorbent strip through which the surface water can penetrate deeply.

Though Spain and his associates are very enthusiastic about the results of this first year's work, it is hard to get any scientist to make recommendations so early in the game. They have gone on in 1956 to

Excess water is channeled deep into the soil.

put vertical mulching on slopes where they can measure every drop of runoff; they have put it on fields where they can compare it with deep tillage and with deep placement of fertilizer; they have tried combining vertical mulching with deep placement of fertilizer; and they have experimented with different spacings of the channels. Though they may show what the layman considers a maddening restraint about making recommendations, the scientists are still quite human about guessing what the results of this work may be. They feel quite sure that vertical mulching will have its best results when the soil is dry and there is plenty of good mulching material as there is in late summer following small grains. They also feel that it may work very well after corn, particularly when the corn has been harvested early and the dry soil is right for deep tillage. Corn stalks, husks, and cobs, they have found, make excellent mulch.

"Out in Oklahoma and Texas, where I spent most of my life," Spain said, "the dry weather cracks the soil almost every year and gives the farmers a version of deep tillage and out there we have found that subsoiling usually doesn't pay. With the first rain both the natural and man-

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made cracks seal up and we get water racing across the fields, we get sheet erosion, and to top it all off we lose the water that we need so desperately while the suboil remains dry. I am convinced that vertical mulching will be of real value there. I also think it will do well on rolling grass farms where heavy soils and winter freezing prevent good water penetration."

On poorly drained land, Spain believes that vertical mulching can make it possible to increase the spacing between tile lines. Digging the mulched channels at right angles to the tile lines creates a drainage grid with the mulched channels providing a short-run drainage system and the tile carrying the water over the long run. Where the drainage problem is localized in potholes vertical mulching should be able to do the job alone. On most parts of the fields the channels will improve the drainage and prevent the runoff onto the low potholes. And on the holes themselves, it will break through the hard pan and allow the water to escape.

This new technique also opens up exciting possibilities for farmers who have wanted to use sprinkler irrigation, but have held off because of poor drainage. There is little use in sprinkling on the water if you can't get penetration, but with vertical mulching, water can penetrate deep into the root zone. Another irrigation practice—the heavy watering of soil to leach out the surface salts—may be improved by this new discovery. Western soils men who work with this leaching problem feel that vertical mulching will improve the chances of washing the harmful salts out of the root zone and down into a deeper horizon where they will do less harm.

The problem of spacing between channels is difficult because here the scientists must deal with the slope of the land, and the nature of the soil, as well as the purpose of the treatment. In their own experiments, however, they are using a wide range of spacings. For runoff and erosion control on gently sloping land, they have spaced the channels 80 inches apart so that a pair of corn rows will fit between each pair of channels. In the near future, they plan to try corn on steep land—even up to a 15 per cent grade—spacing the channels 120 inches apart. In order to keep the mouth of the channel from silt-

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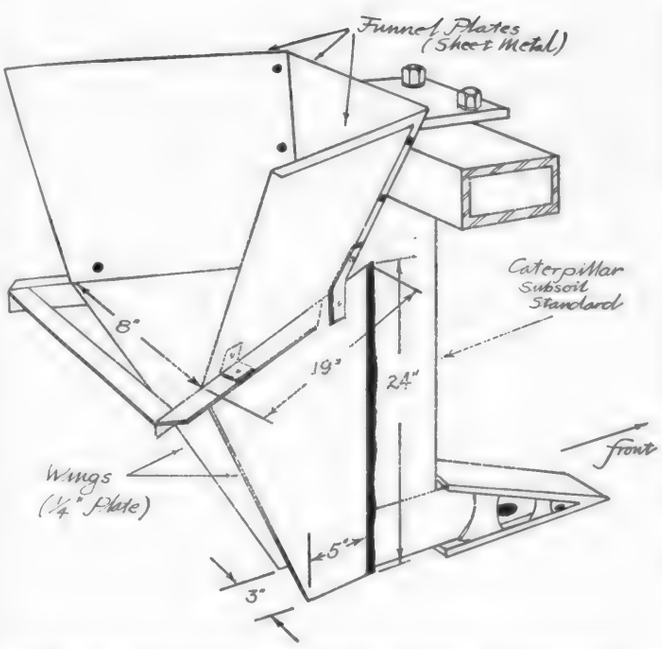


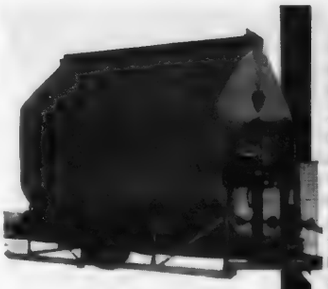
Adding steel wings converts a deep tillage tool into a vertical mulcher.

ing over on this steeper land, they will allow a 20-inch strip of sod to grow on each side of the channel mouth. This will still leave them room for two rows of corn between each pair of channels. Both the channels and the corn will be worked on the contour. The next channels will be placed midway between the old water-absorbent channels which will add to root penetration as well as to the water-holding capacity of the soil around the roots. With the alternate wide middles, it will be possible to seed a winter cover in the late summer or early fall.

In their drainage experiments, they are using spacings from 5 to 30 feet, hoping to bracket the best spacing for the soils on which they are working. For supplemental drainage, the channels will not need to be completely filled, most of the water movement being in the bottom half of the channel. However, for runoff and erosion control, they feel that it is very important to fill the channel completely and protect the entire channel so that the surface does not become sealed over. This brings up what is perhaps the most important practical factor in determining the spacing of the channels—the amount of material available on the field to fill them. If it takes a strip of stubble 10 feet wide to fill the channel, you can't very well space the channels any closer than 10 feet without hauling in extra material.

In practice, Spain and his fellow workers have found that two rows of corn stalks from a stand of corn that runs 85 to 90 bushels to the acre will do a good job of filling a channel. An 80-inch strip of heavy wheat or oat stubble is also about right. It takes a lot of material any way you look at it.

As yet, no vertical mulching machinery is available from manufacturers. The equipment used at Purdue was modified and assembled in their Ag Engineering shop. The major change involved is the modification on the subsoiler shown in the drawing above. It takes a lot of power and traction to pull such a tool through heavy soils. This means either a small crawler tractor or a large 4 or 5 plow wheel tractor. A self-powered forage harvester is necessary because of the power requirements and the problems involved in using the power take-off with the tool bar and draw bar mounted on the tractor. Since the changes are slight, and simple, it shouldn't be long before some company comes up with the tool to do the job.



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All-galvanized Behlen Crib featuring new steep-pitch roof design saves your time, permits quick, full-capacity crib filling. Eliminates hand leveling. New roof also has an easy entrance section and extra-large peak opening. Steep roof angle lets elevator lay against roof with spout directly in opening — eliminating need for extra chute and time-taking adjustment. Available in 611-bu. to 2,367-bu. capacities.

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gives you 12 months of perfect crop weather . . . every year!

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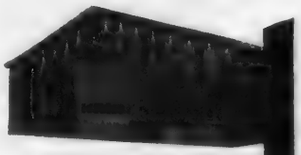
Extra-deep corrugations in heavy gauge galvanized steel assure greatest strength and rigidity. Withstands the weight of stored grain without the need for cross ties, etc., in the doorway. Exclusive Double-Seal Door gives double protection — keeps grain in, keeps weather out! Available in six sizes — 1,000-bu. to 3,200-bu.



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Behlen Buildings are custom-built at standard prices — completely prefabricated to meet your specifications. Sturdy, self-framing construction of heavy gauge, channel-ridged metal permits eave-to-eave grain storage, without double walls. Pick your own grain storage capacity, one thousand to one million bushels.

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Extra heavy gauge steel bar mesh — "Post-Fab" galvanized. Tunnels are 20" wide, 17" high. Ventilators, available in 4-ft. sections, 10" diameter.

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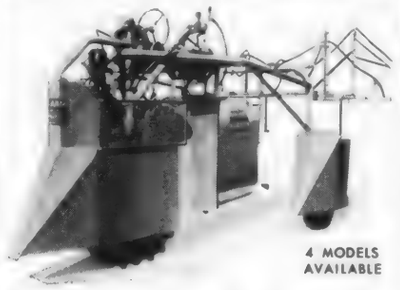

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100% More Horsepower
21 Brand-New Features

More farmers bought Hi-Boy in '56 than all other makes combined. It's the only high-clearance sprayer with RUST-PROOF TANK and SPRAYER BOOM SYSTEM of ALUMINIZED STEEL as standard equipment.

SLOPE-TYPE FENDERS prevent bruise damage —even in the tallest crops.

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Awarded by the Farm Equip. Mfrs. Ass'n.

CORN—Kills earworms, corn borers, and weeds. Topping attachment makes harvesting easier.

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HAHN HI-BOY
THE HI-SPEED SPRAYER

A HAHN SPRAYER FOR EVERY SPRAYING JOB ON THE FARM

FERTILIZER-INSECTICIDE MIXTURES

(*Continued from page* 58)

Corp., 59 East Madison, Chicago 5, Ill. An emulsifiable liquid is a cheap way to buy an insecticide used for soil insect control. If the liquid form is sprayed on top of the ground in a broadcast application it is important to disk it into the ground as soon as possible. The only additional cost of using insecticides in this way will be for the material itself and that will be about $1.25 per acre. Liquid injectors and spray nozzles that mount on the corn planter and put the combination fertilizer-insecticide mixture right in the row with seed are available this year, too. One of these is made by Century Engineering of Cedar Rapids, Iowa. This precise placement is, of course, more economical than a broadcast treatment of the field.

The liquid form of these insecticides can also be used as a straight material application, without the liquid fertilizer. It is often used in this way on sod that is ready to be plowed under, to kill the grub and cutworms. Here again fast disking into the soil is important. Several of the insecticides are volatile and when they are laid on the ground under a hot spring sun they fly away if they are not worked into the ground within an hour or two.

Dry granular forms of the various insecticides may be applied as a straight material by a special dispensing unit that mounts on a corn planter. This meters out a vari-

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SELF-SHARPENING ACTION. Magnified section shows how blade looks after use. Corrugated edge sharpens itself, cuts trash faster.

The new Lantz Til-Kut blade is now available with center holes to fit all major line plows—IHC, JD, AC, M-H, Case, M-M, Ford, Ferguson, Oliver, Cockshutt, as well as all Lantz Coulters. It cuts heavy stalks and trash with a chewing motion. Til-Kut edge grips from all angles—prevents slippage and plugged plow. You'll get cleaner plowing and better corn borer control. Blades sharpen themselves. Last longer, too, but cost no more than ordinary blades. Write today — use coupon below.

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Grapple Hay Forks • Swinging Sickle Grinders
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VALPARAISO, INDIANA
Please send me more information on new Til-Kut Blades.

Name ..... RR No. . .

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My favorite farm implement dealer is .....

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see page 156

CHEMICALS TO KILL SOIL INSECTS*

Pest	Crop	Where Found	Control
Corn rootworm	corn	second and later years of corn in same field, or old cornfields after 1 year in another crop.	½ to 1 lb. aldrin, heptachlor or BHC per acre.
Black cutworm	corn	grassy lowland fields	2 lbs. toxaphene or ½ lb. dieldrin per acre sprayed over rows
Sod webworm	corn	sod ground broken for fiirst-year corn	as above
Corn billbug	corn	sod ground broken for fiirst-year corn	1½ lbs. toxaphene or DDT per acre over the rows
Seed corn beetle	corn	any field in cool, wet spring	lindane seed treatment or soil treatment
Seed corn maggot	corn, soybeans	heavily manured fields, cool, wet spring	lindane seed treatment or soil treatment
White grubs	corn, soybeans	following sod	deep, early fall plowing; 3 lbs. aldrin, heptachlor or dieldrin disked in
Wireworms	corn	usually in wet or poorly drained fields	lindane seed treatment or 2 lbs. aldrin or heptachlor per acre disked in
Sweetclover weevil	sweetclover	damage in new seedings	1 to 1½ lbs. DDT or ¼ lb. dieldrin per acre
Cornfield ants	corn	rolling ground, usually upland	1 lb. chlordane per acre sprayed over rows or soil treatments as above
Corn roots aphid	corn, wheat	any field	control ants to prevent damage by this pest
Grape colaspis clover rootworm	clover, soybeans, corn	damage to crop following clover	soil insecticides formula as used for rootworms

*As recommended by Iowa State College for mineral soils. For muck soils double the amount of insecticides.

able small amount and drops it through a tube into a band alongside the seed and with the fertilizer as the planter operates. Among the first of these fertilizer attachments that were available for corn planters are those made by the E. S. Gandrud Co. of Owatonna, Minn., and John Deere, Moline, Illinois. This is an inexpensive way to apply insecticides and one of the advantages is that the amount may be varied.

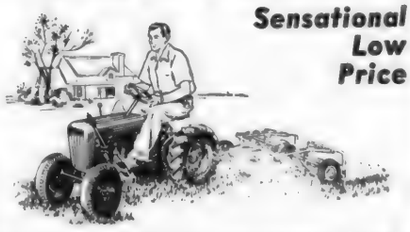
Dry Fertilizer-Insecticide Mixtures

In Iowa, Dr. J. H. Lilly points out, much of their work and recommendations are for the complete dry fertilizer-insecticide mixture. "This is available from just about every fertilizer house in Iowa." In fact, in 1956 one pound out of every eight pounds of starter fertilizer used was a combination mixture. We used 225,000 tons of fertilizer-insecticides of approximately one million tons total used on corn.

When the fertilizer manufacturer makes up his combination fertilizer-insecticide in the dry form he has the choice of mixing a dry form with starter fertilizer formula or using an oil solution insecticide. The oil solution is sprayed over the fertilizer by a series of nozzles as it is moved on an endless rubber belt. It has the advantage of being slightly less dusty. The bag is labeled with the amount of insecticide that has been added. For rootworm control the application rate calls for ½ pound of insecticide per acre, so if the farmer uses 100 pounds of starter fertilizer per acre his fertilizer-insecticide combination should contain 10 pounds of insecticide per ton. The bag will show the amount of insecticide the mixture contains. There are usually two or three available concentrations, and some firms make up special concentrations on order.

The additional cost of fertilizer which contains 10 pounds of insecticide per ton

WHEEL-HORSE
The Fun-Work Yard Tractor



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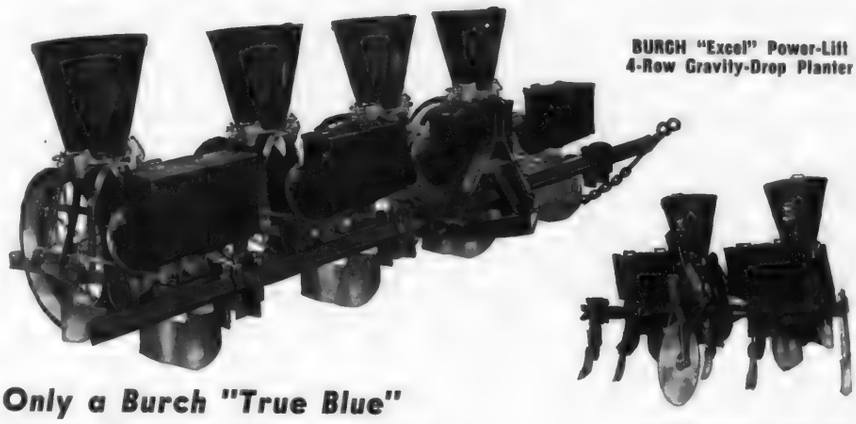
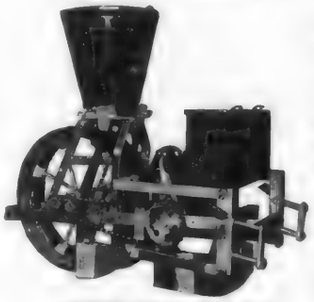


BURCH "Excel" Power-Lift 4-Row Gravity-Drop Planter

Only a Burch "True Blue" Plants Uneven Sizes of Seed Uniformly . . . Accurately!

BURCH "Excel" Power-Lift 2-Row Gravity-Drop Planter with Attachments



BURCH "Parallel" 1-Row Gravity-Drop Planter Unit

Here's what a major commercial producer of hybrid seed corn (name on request) says about the BURCH "Excel" Gravity-Drop Planter: *"First major improvement in years of corn planter history . . . less to get out of order, less to adjust, and with only two planter plates needed a farmer is sure of having the correct size for his seed year after year. Thanks for your forward look . . . farmers will thank you too!"*

The BURCH "Excel" can be furnished as a self-contained planter and cultivator. FIRST ever built that can drop seed accurately at tractor speed no matter how uneven the sizes. Designed to permit application of fertilizer as recommended by leading agronomists. BURCH Planters offer more choice of types and sizes than any other make. More farmers use BURCH Planters than any other make!

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ONLY FLEXI-HOE features individual one-row gangs with TRIPLE FLEXIBILITY—to assure complete, thorough coverage of any field. Tough, straight teeth blast weeds with "explosive" force. Available with 14" or 18" diameter all-steel PATENTED spider wheels—unequalled for mulching and break-up. Also offered in 2-row and 3-row sizes (Drawbar FLEXI-HOE in 2-row to 8-row.)

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the all-purpose, 8 row, high-clearance unit that sprays, dusts, tops, cultivates, defoliates, and fertilizes ... provides control of insects, blight, and weeds. The Crop Protector increases its value through multiple uses for corn, cotton, tobacco, peanuts, grain sorghums, other row crops and small grain.

The versatile FINCO Crop Protector is rugged, fast, and safe ... with 28 important features that assure more profits for farmers, more convenience for the driver-operator.

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is approximately $20 to $30 a ton. So if you apply 100 pounds of starter fertilizer per acre and it cost an additional $25 per ton, your added cost for the insecticide will be $1.25 an acre. It's cheap insurance against the soil insects and bugs. And it can pay off, in badly worm-infected land, to the tune of 5, 8, 25, and up to 50-bushel increases in yield.

Is It Safe?

"We feel that the dry fertilizer-insecticide mixture is one of the safest ways for the farmer to use insecticides," say Dr. Lilly. "It is in such low concentration that it is quite safe. We don't like to see a farmer inhale very much of the dust, but since he is outdoors, this doesn't happen. It isn't a good idea to get the material in cuts either. The only complaint we have is that the stuff smells. We think that is an asset; if a farmer opens the bag and smells insecticide, he knows he should handle it with care, if only because it costs more. A special label is required by all states and many of these carry directions for use."

In Other Crops

"Probably one of the most promising uses for granular insecticides, using a distributor on the planter, is for direct application near the seed. Instead of banding the insecticide with the fertilizer we would drop it in the hill with the corn seed. This may have a big future with sugar beets. In Michigan it may be the answer to cutworms and other soil pests that bother onions, carrots and radishes. All of these insecticide materials are practically insoluble in water so there is little chance for translocation into the plant where they could cause chemical residues in edible vegetables.

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Another excellent egg-meat combination. Plump bodies, shorter legs. Economical feed conversion.

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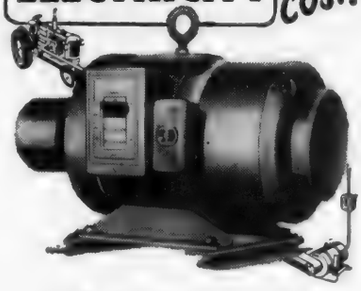

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NO MORE BLACKOUTS! An Onan Tractor-drive Generator supplies regular 115/230-volt A.C. power for lights, heating system, milker, brooder, food freezer, water pump *and all essential equipment* for as long as you need it. FOUR MODELS: 3,000, 4,000, 7,000 and 10,000 watts. Complete with belt pulley, double-throw transfer switch, circuit breaker, plug-in receptacle and voltmeter. Like any other electrical equipment, standby generators must be properly installed. An Onan Tractor-drive Generator includes a manual transfer switch *which automatically assures a safe installation.*

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What Happens To Good Worms?

"There have been many people write us to ask, 'What happens to earthworms?,' says Dr. Lilly. "We know that at the recommended low dosages the insecticides are not harmful to earthworms or useful nitrogen-fixing bacteria. If we ever soup-up our insecticide applications to get an all-out kill of soil pests then we could kill useful bacteria and earthworms, as well as the harmful ones.

"Seed treatment with insecticide by seed companies or farmers gives us another chance to kill the rampaging soil worms. It complements the treatment of the soil with insecticides—the two work well together."

Worms and insects will be battled by chemicals selected to do specific jobs like these that control soil insects. It's a big job; of the 80,000 varieties of insect pests in the U. S., 7,000 are injurious to crops.

TORNADOES

(*Continued from page* 54)

a split minute. Of a sudden it was calm. Outside, the house was gone, completely vanished. The barn was a twisted lumber pile. Except for the two of them, there was no life in sight.

What Are They Like?

Tornadoes happen most often between the Rocky and Appalachian mountain ranges. Well over 200 occur each year in the United States. The atmospheric conditions that cause them are involved and not too clearly understood. There is no such thing as a normal tornado. Every one is unusual, in time, in place, in capriciousness. Their tendency is to form on muggy, oppressive late afternoons in spring and early summer. Mammatocumulus clouds, which seem to hang in bunches upside-down, nearly always accompany them. Often the sky suddenly blackens, several clouds roll together, hail falls at times, or heavy rain. The pendage, or funnel, does the real damage. It spirals down from the massive parent cloud. Sometimes, instead of taking a funnel shape to the earth, snake- or rope-like tentacles appear, now and then stretching horizontally across the sky.

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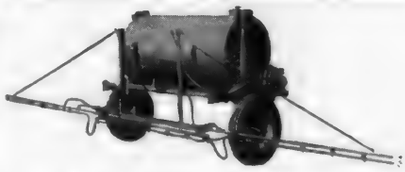
Equipment



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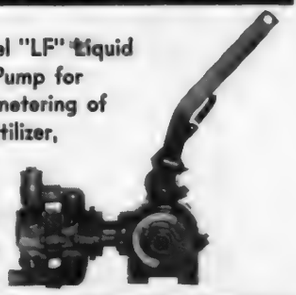

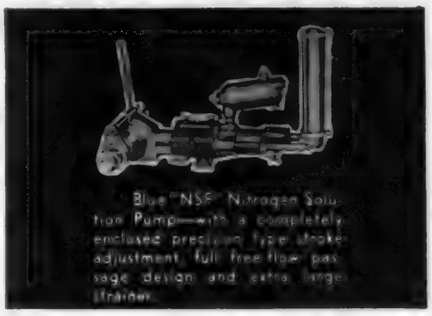

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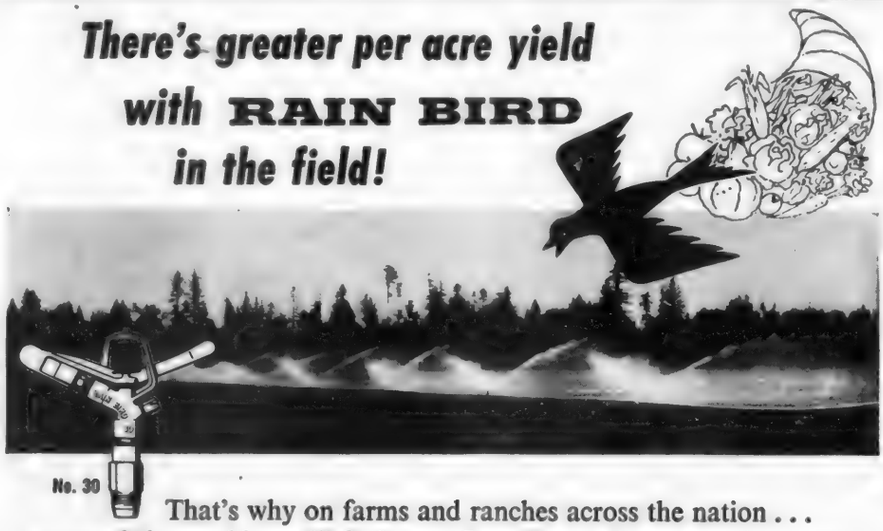

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Sometimes the funnel races forward, keeping contact with the ground. Frequently the funnel swings and dips, hits and frees itself, like an enormous elephant trunk. Where the funnel touches, buildings explode, heavy equipment hurtles through the air, creeks and wells are sucked dry in a flash, forests are leveled as if by a giant mowing machine.

The death-dealing is due to more than wind velocity. The spiraling, uprushing currents within the vortex of the funnel suck everything with them and are believed at times to create a partial vacuum which will literally cause an ordinary building to explode. Snowden D. Flora, retired U. S. Weather Bureau expert of Topeka, Kansas, who has spent several score years in tornado hunting, says, "We actually don't know much about tornadoes. We've never had any instrument in the center of one. The instruments would probably be destroyed anyway. Just what goes on inside a tornado is not yet solved. If we knew that, we'd probably have the answer to a lot of other questions such as why a tornado causes a building to explode."

Scientists point to evidence that indicates the speed of currents within a tornado funnel reaches up to 500 miles per hour. The direction is nearly always counterclockwise in the United States. Tornadoes move at an average ground speed of about 45 miles per hour. Of those officially clocked, the slowest tornado moved at 5 miles and the fastest at 65 miles an hour, traveling, for the most part, from southwest to northeast, along curving paths. Often they strike and destroy, then skip miles before funneling down again. They usually move between 10 and 15 miles before dissipating, though a few have covered over 200 miles. The swath they cut generally is not over a quarter mile wide.

Be Prepared

Question: How do you ready yourself for a tornado?

Insurance isn't the best answer, but it helps—afterward. Tornado damage is, of course, included in property insurance. The livestock and the items of equipment purchased between insurance premium payments often remain uncovered. Check your policies to be sure.

Richard Garrett, Kansas meteorologist, of the U. S. Weather Bureau, says, "Probably no type of building can take a dead-

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center hit of a severe tornado without damage. Modern steel-reinforced buildings hold up best, but few farm structures can take it without serious damage." Some types of buildings are especially vulnerable. Flimsy structures collapse quickest. Well-made buildings that are not securely anchored down tend to lift as a unit. Sizeable buildings with few interior supports, like wide-alley barns and churches, suffer badly.

The remedy is in line with general recommendations for good, all-purpose structural design. Closely-spaced rafters and rafter ties, plentiful collar beams, heavy studding, metal fastening plates and sound lumber pay off, for they at once prevent lifting and collapse. Foundations should extend below the frost line and anchor bolts should be in accord with established recommendations. Pole barns, especially of the open type, hold up well in all except direct hits, particularly if of bolted construction, with the poles sunk five feet or more in the ground. Diagonal bracing is always desirable. Diagonal sheathing has time and time proved its worth; diagonally sheathed buildings have frequently been toppled with no real damage when nearby buildings with vertical or horizontal sheathing have been demolished. Load-bearing interior partitions, tied to the structure above, hold a building down and up and together.

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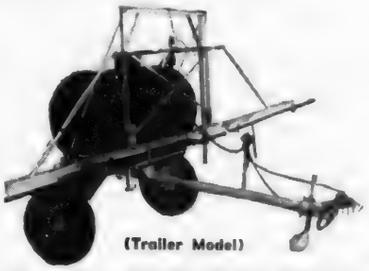

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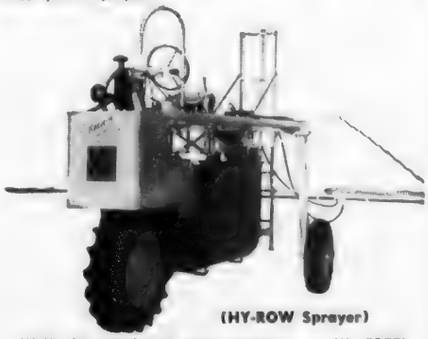

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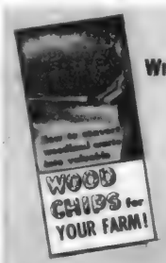

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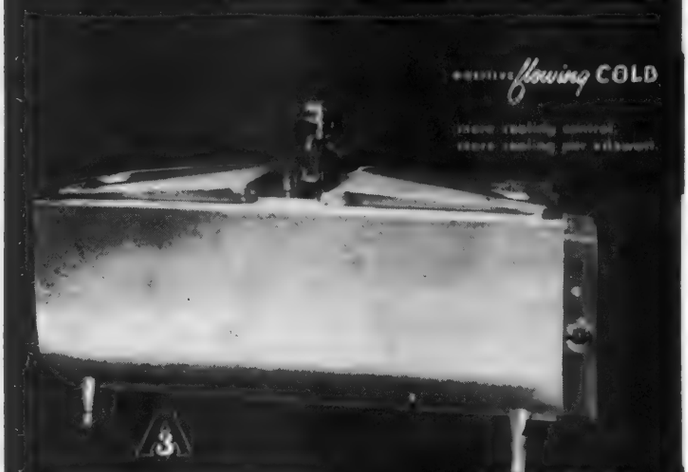

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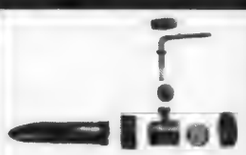

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architects give specific nail sizes and amounts. The same is true with roofing materials. Manufacturers specify the kind and amount of nails to use. When properly applied with sufficient nails, strip shingles of asphalt, if spotted with roof cement, can take a beating. Wood shingle roofs are too often laid with too much exposure to the weather and, as long as they don't let rain pour in, are neglected beyond the point where wind can easily damage them. Roll roofing is least desirable from a wind standpoint, for the wind will manage to get under the smallest loose spot and tear it off in strips. In nailing any roofing material, large-headed nails minimize the tendency for the roofing to tear at the nail heads. Nails should go at least ¾ of an inch into the roof deck.

With metal roofing, a good rule is to allow 100 nails per 100 feet of roofing. Screw shank nails give many times the holding power of smooth nails. The moisture content of the lumber at construction time and at the time of high winds also are factors in a nail's holding power. Leaking roofs are weakening roofs. Metal and vertically-applied roll roofing should be lapped away from the prevailing winds. Overhanging eaves invite disaster. Weak roof supports not only allow roofing to blow off, they also offer little resistance to flying objects.

As far as metal buildings are concerned, is a light metal sheet an invitation to wind damage? The experts say no. The force of high winds is too great for the weight of roofing or siding materials to help it stay in place. In many rural storms, metal buildings have stood up where all but masonry structures have gone down. It is not necessarily so that the metal is superior. Rather, it is more likely that the metal buildings are newer, and more substantially designed by the manufacturers. A group of three metal buildings designed to resist wind and tornado damage were submitted to recent atomic tests in Nevada. Two of the structures were demolished. The third, of Behlen manufacture, came through the nuclear blast with little damage other than dents in the siding. This new type of frameless building owes its structural strength to the use of curved, deeply-corrugated sheet metal panels, bolted to each other and to the foundation. The building withstood a force equal to 30,000 tons of TNT. This type of metal building would likely withstand any stress a tornado would create.

What else can you do to prepare? Essentially you should tie everything down that you can. You won't miss a flown garbage can or a wrecked bicycle much, but either can be an engine of destruction when hurtling through the air. Trees should be trimmed back from buildings and weak trees cut down.

There is no record of anyone ever having been injured in a storm cellar when a tornado hit. A storm cellar, fruit cellar, cyclone cave, scare hole, or whatever, is still your safest bet. Their dual purpose of storage and shelter, along with their inexpensive construction, makes them essential in rural, tornado areas. All that is needed is a scooped-out hole, shored up with timbers and mounded with dirt above. Tile drainage, where possible, also aids ventilation. The door, the latch, and hinges should be stout. An escape hatch provides an emergency exit, equalizes inside pressure, and also helps ventilation. A floor area of 6 ft. by 8 ft., 7 feet high, will provide temporary shelter for 8 people plus some wall storage space. Side, floor and overhead planking is satisfactory, but masonry naturally is more permanent. A pick, shovel, and lantern are good to have on hand at all times. A storm cellar should be near the southwest corner of the house, far enough away so that the entrance will not be blocked by falling timbers.

When a tornado is imminent, waste no time getting to the storm cellar. If underground protection is not handy, take shelter on the lower floors of the strongest reinforced building, crouching against the wall. In frame houses, the southwest corners of basements usually offer greatest safety. Basements of masonry houses, unless strongly reinforced, are death traps. In homes without basements, lie on the first floor; always avoid windows. In open country, move at right angles to the approaching tornado. In a car, you can usually outrun the storm. If there is no time to escape, lie flat in the nearest ditch, away from anything that could fall or roll over you.

Question: How far from the center of the funnel can you expect damage?

There is just no telling. A tail dipped down from a cloud near Bear Lake, Mich., last summer, and blew up a farm house, but left a barn nearby and an orchard across the road untouched. The tornado which hit the Wesley Walkers, Dodge City, Kansas, trailed a funnel that dealt chaos all around a man changing a tire, but only sucked off his hat as it skipped over his head. Other tornadoes, such as those that struck Udall, Kansas, and Blackwell, Oklahoma, last year, caused wind damage 50 miles or more from their centers. Such wide-spread devastation is usually due to a series or family of tornadoes, gaining and losing funnels as they stalk forward.

The capriciousness of a tornado is hard to believe. Those who have experienced a tornado's freakish capers say they are willing to believe anything henceforth. Straws driven into tree trunks are common. Fence wire, torn from its posts and wrapped up into rolls, has been seen a number of times. In Nebraska, Milton Tabor saw a tornado that twisted off every tree in a large cottonwood grove where the trunks averaged over two feet in diameter. The timber was neatly ricked on each side of a cleaned, 40-foot swath. Less than two years ago, a Missouri tornado sucked a car out of a garage and caused only minor damage to the car, which was dropped over a mile away. These incidents were reliably witnessed. A well-known tornado yarn has less reliability. According to this one, a tornado sucked all the ear corn from a crib through one knothole. The hole was only big enough for the cobs. The shelled corn was left in the crib. Even more difficult to believe is the tale of a rooster blown into a jug.

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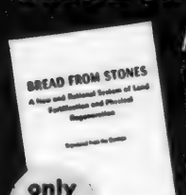

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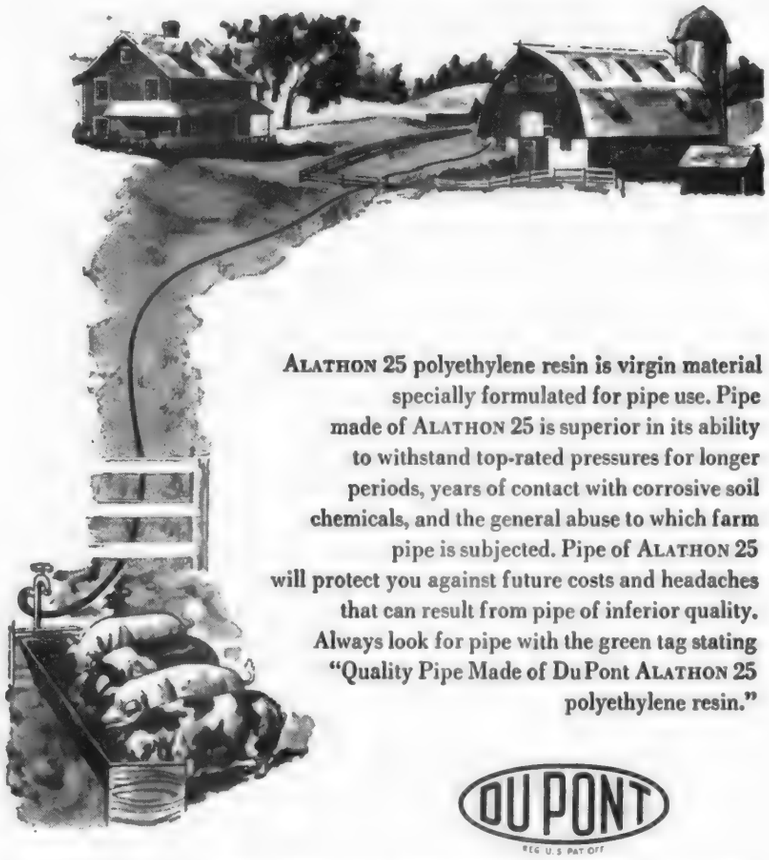

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On Your Side

Question: What is the Weather Bureau doing?

The Weather Bureau is not napping. They are out there, 24 hours a day, for your benefit. Of course, they don't always call their shots right, but the weather and especially tornadoes, are tricky. Look in on your local weather bureau, like the one at Topeka. These offices are systematically spotted across the nation and are linked with the severe storm warning center at Kansas City which has all available meteorological equipment at is command. Many of them are now equipped with radar so that one station overlaps the other in coverage. They not only gather weather information, they also have assumed the duty of keeping the public informed.

The Topeka station sends up four weather balloons daily, carrying radio broadcasting devices which by tone signal records data on ground equipment, giving temperature, humidity, pressure and wind direction to 80,000-foot heights. In Kansas alone, over 300 individual observers keep constant weather records, reporting any unusual conditions by phone. Each weather bureau is in continual teletype communication with the entire national network and each keeps in close connection with local newspapers, radio, and TV offices.

Radar has greatly increased each station's defenses. When a tornado is in the making, police and public agencies, like radio stations, are alerted by a forecast. If a tornado is approaching, a warning to dig in is quickly made public. Storms within 200 or more miles show up readily on the radar screen, but a tornado pattern is not easily distinguishable from other severe storm activity. Weathermen, at the risk of appearing foolish, take no chances. In the spring of 1956, in less than one minute after a tornado, 70 miles distant, appeared on the radar screen as if approaching Topeka, the local sirens had sounded at police and fire stations. The entire town was under protection in a matter of a few more minutes. The tornado passed without striking Topeka directly, but the weathermen were there with the ounce of prevention.

The chronology of events that evening was as follows:

(1) The Topeka radar detected what appeared to be a severe storm 70 miles to the southwest moving directly toward the city at 65 m.p.h.

(2) A citizen (name unknown) spotted a tornado over the Flint Hills pasture land in the same area where the storm was being observed by radar and got the word to the county sheriff.

(3) The report was relayed by police radio to the Wichita Weather Bureau.

(4) Wichita passed the information along to other Weather Bureau Offices.

(5) When the tornado report was received at Topeka it was correlated with the radar storm. Because this storm was moving so fast over sparsely inhabited country at night there was a good possibility no further reports would be received on it before it reached Topeka. Accordingly, warning of the approaching storm was released to the public immediately—within 10 minutes of the time the funnel was spotted by the unknown citizen 70 miles away.

(6) As the storm neared Topeka radar showed it weakening rapidly and the "ALL CLEAR" was released when danger had passed, an hour and ten minutes after the warning was issued.

(7) It was later determined that a great percentage (but not the entire town) of citizens sought shelter. Also that tornado damage occurred within 15 miles of the city.

PLASTIC PIPE

(*Continued from page* 79)

metal, are being made in rigid plastic and aluminum as well as galvanized and stainless steel. It is worth remembering that the rigid plastic as well as the metal fixtures *can* be damaged by freezing and should be protected. The only tools necessary for connecting these fixtures to the pipe are a pocket knife and a screwdriver for tightening the clamps. If rigid plastic pipe is used, the methods of fitting and the tools to make the fittings are multiplied. Rigid pipe may be threaded and fittings screwed on, it may be heat welded together by a skilled operator, or it can be cemented together with solvents or ad-

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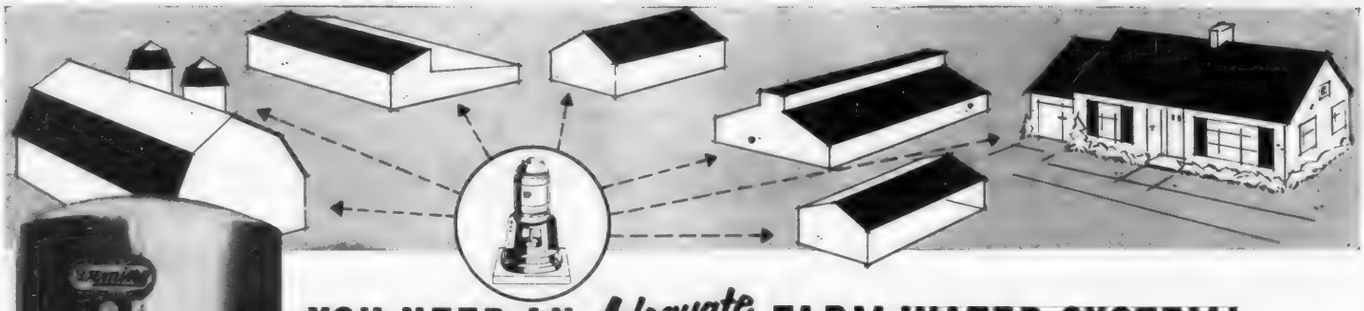

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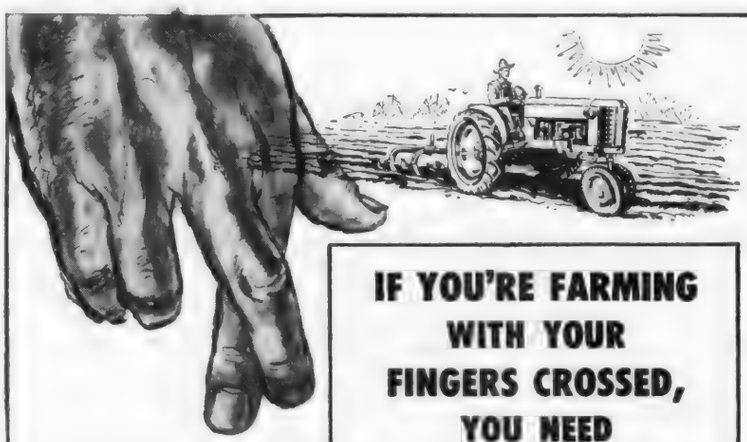

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hesives. With the hard pipe the pocket knife will have to be replaced by a saw for cutting. Since each plastic has its own chemical properties, it is necessary to use the recommended solvents and cements with a particular pipe.

After the line is installed, one of the important qualities of most of the plastic

To put down pipe with a subsoiler, a cut is made with the tool, then the pipe laid out.

pipe is noticed—or, rather, it is not noticed. Most plastic has no flavor and so adds no taste to the water. Freedom from taste of pure polyethylene and some of the other newer plastics have made it possible for Swiss farmers to string this lightweight pipe to the telephone wires that connect their Alpine farms with the valley and pipe their milk down without contaminating the fresh flavor. It is import-

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Choice of Ground Driven or P-T-O Operated

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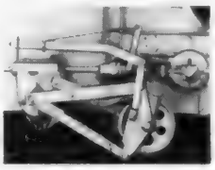

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ant to point out, however, that this is true of most but not all pipe now on the market. Cheaper grades of pipe are now being manufactured from remelted scrap plastic which does add flavor and possibly other undesirable qualities to the water it carries. While this pipe is satisfactory for transporting water for the garden it should not be used for carrying drinking water. In order to take the guess

Threaded through the subsoiler attachment, the pipe can be laid deeply with little effort.

work out of pipe buying, the manufacturers of plastic pipe recently agreed to mark the pipe which is suitable for transporting drinking water with the National Sanitation Foundation Seal of Approval. Pipe which carries the N.S.F. seal stamped on it has passed the rigid tests laid down by the Foundation and can be used without fear of pollution.

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The transportation of drinking water is, of course, not the only farm use for plastic pipes though it is a very important one. Large collapsible pipe, "the ditch you can carry on your shoulder," as someone called it, has been developed for gravity irrigation systems and other semi-rigid plastic pipe for sprinkler systems. A plastic drainage pipe has also been produced as well as plastic liners for leaking ponds. Every day new uses are being discovered.

The Hyatt brothers didn't know it, but when they molded their first billiard ball and fashioned their first celluloid collar, which became the symbol of the non-laboring class, they started a chain of events which has taken the labor out of agriculture and made the farm house a more comfortable place in which to live.

SHOULD I INCORPORATE MY FARM?

(*Continued from page* 77)

the other. It is also a simple matter to use funds from the fruit farms, for example, to build a new milking parlor on the dairy farm or to tap the resources of the dairy farm to buy a new high-powered sprayer for the fruit farms.

The corporation is sometimes suggested as a means of raising additional capital for the farm business through the sale of stock. Unfortunately, this is another area where the theory is fine but bears little resemblance to reality. The investor whose primary concern is a dividend return will find little attraction in the common stock of a family farm corporation set up to make money for the operators who establish themselves as salaried employees. Any farmer whose interest in incorporation is based on this motive had better reconcile himself to the use of the good, old-fashioned mortgage loan. There is just one reservation that might be made here, that is the possibility of putting a plan like Professor Miller's into operation. We will take a close look at that shortly.

Taxes

One of the decisive elements a farmer must consider in weighing the possibility of incorporation is the tax angle. In general a good rule of thumb is that as long as the income from the farm or farms is relatively small the operator will do better under individual rates. A relatively large income will show up better after taxes under corporate rates.

Expert legal guidance in setting up a farm corporation is quite necessary. Let it be said here and now and with all emphasis that no one should ever approach the problem without carefully going over all the details with a competent attorney. On this matter of taxes alone, for example, there are such points to consider as the advantages which accrue when a husband and wife file a joint return, allowances for dependents, and capital gains provisions.

August Eckhardt, Professor of Law at the University of Wisconsin Law School, who has devoted particular attention to the matter of farm corporations, points out that the corporate tax rate begins at 30 per cent and remains constant for the first $25,000 of income earned. The individual's rate begins at 20 per cent and increases with each $2000 earned. On this basis the individual pays more tax than the corporation once his taxable income hits $14,000. A corporation would pay $7,500 on a $25,000 income while the individual would pay $10,150.

Unless the farm corporation pays practically all of its profits to the operators as salary the specter of double taxation rears its ugly head. Profits which are transmitted to the shareholders as dividends are taxed first when they are in the hands of the corporations and again when they are received by the stockholder. But the courts have been lenient in permitting small corporations of this type to set their salaries high enough and to issue such year-end bonuses that all the coporate profits are drained off. It is also permissible to set salaries low at the beginning of the year in a business of high risk, such as truck farming or specialty crops, with the provision that they will be raised considerably if all goes well.

In some areas the incorporated farm may run into another

problem, double taxation brought about by being required to pay local property taxes on the assets of the farm and again on the stock itself. Some jurisdictions credit the stockholder for whatever property tax the corporation may have paid on its assets, or vice versa, but if such credit is not allowed the stockholder will be paying more in the way of property taxes than if the farm had not been incorporated. This is probably not a serious bar to incorporation, but an item which should be looked into with the intention of taking whatever steps are available to acquire protection against this additional tax.

Social Security

Since net earnings are the controlling element in determining the amount of retirement or survivorship benefits earned under social security legislation, Dr. Robert Smith, of Cornell's Department of Agricultural Economics, points out that farm operators approaching the retirement age of 65 may find it to their advantage to incorporate their farms and become employees of the corporations so they can receive a constant salary for at least a short period of years, even though the corporation may show a loss.

Splitting the Income

It was mentioned before that one of the advantages of the corporation is that it permits the switching of funds from one enterprise to another very simply and without any intervening taxes. Another way in which it enables tax savings to be made and capital acquired for expanding the physical assets of the business is through the splitting of income three ways, between father, son, and corporation, for example, rather than only two ways, between father and son. This is of

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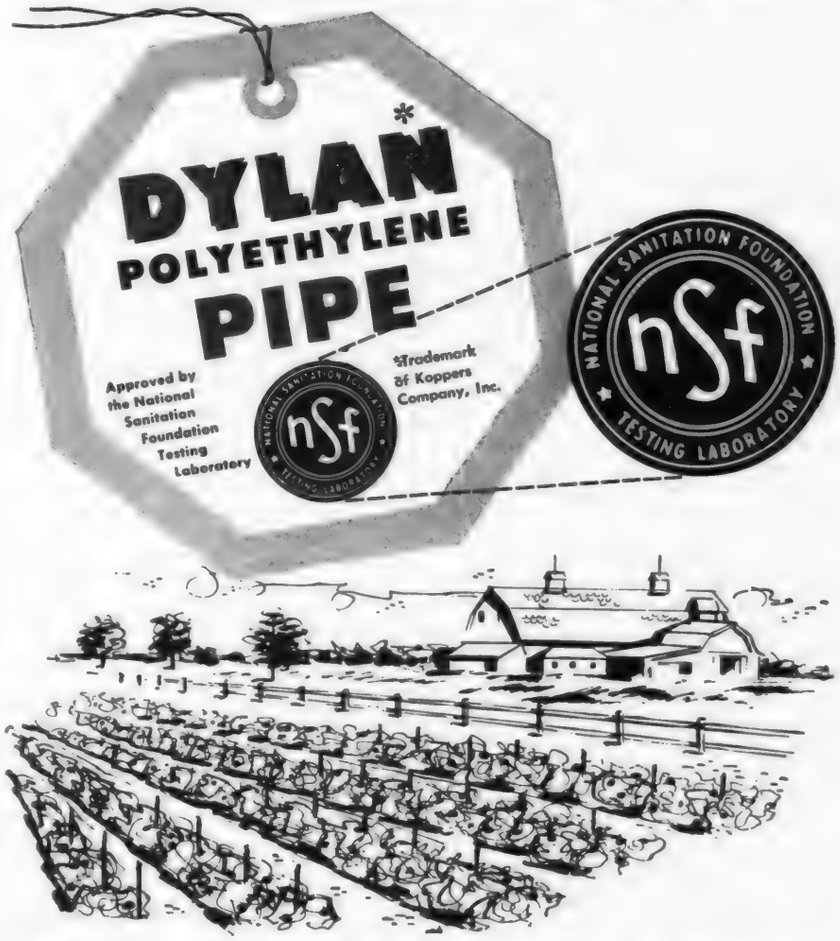

Whether you're installing a new farm water system or renewing old lines, it makes good sense to invest in the very best equipment. That's why so many dollar-wise farmers today buy polyethylene pipe bearing the red and white Koppers DYLAN tag. It's their absolute guarantee of . . .

1. Pipe that is approved by the NATIONAL SAFETY FOUNDATION for carrying potable water.
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Remember, whether your water system is for irrigation, cattle watering, dairy barn work or general farm use, always choose polyethylene pipe that carries the red and white Koppers DYLAN polyethylene tag. You can't get better pipe. Your local farm supply store or co-op handles polyethylene pipe made with DYLAN polyethylene.

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particular advantage when the income is in the higher brackets. The table on the opposite page, from Jacob H. Beuscher's "Law and the Farmer," shows how these savings may be effected.

Of course, there will eventually come a day of reckoning when these savings will have to be accounted for, but if used for expansion of the business they will be taxed only as capital gains rather than as income. And there is always the possibility that by the time that day arrives the long awaited reduction in income taxes may have become a reality or a new cost basis for the stock may have been created by the death of the stockholder.

The capital gains feature of the tax law makes the individual tax rates more attractive when the income is relatively small. Take the following example which Professor Eckhardt cites: "If a corporation sells a capital item having no cost basis for $500, the corporation pays income tax on that amount computed at 25 per cent. If an individual makes that sale, he includes $250 with his other income and is taxed on that amount at a rate determined by his income bracket but not in excess of 25 per cent of the gross gain. If his rate is below 25 per cent, the gains will be taxed at that lower rate. In the higher brackets he can take the benefit of the "alternative tax" computation permitted by the law. In neither case are capital gains taxed at more than 25 per cent.

But the individual does have this advantage: if his capital loss exceeds capital gains $1000 of the excess of the loss over the gains can be deducted from his ordinary income; on the corporation return such losses are allowed only to the extent of capital gains.

As noted above, the outstanding advantage of the capital gains provisions under a corporation is the leverage it offers in allowing profits to be held in surplus for future improvements; then, when they are finally accounted for on the tax return they show up as capital gains rather than income. To the individual in an income bracket higher than 25 per cent this is a real advantage.

Steps in Incorporating

Attorneys will usually advise families contemplating incorporation of their farms to try a partnership arrangement first if there is any doubt that the corporation may prove unsatisfactory. It is always an easy and inexpensive matter to step up from a partnership to a corporation if it is found that the latter is really the form of organization needed. No tax problems are encountered in setting up the corporation if the regulations of the Internal Revenue Code are followed. According to these regulations persons who contribute assets to the corporation may receive only stock of the corporation in exchange and must come into control of the corporation immediately.

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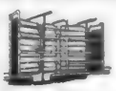

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COMPARISON OF CORPORATION TO PARTNERSHIP WITH RESPECT TO 1955 FEDERAL INCOME TAX PAYABLE. INCOME TO BE DIVIDED: $22,000

Form of business	Income	Tax if neither is married or has dependents	Tax if both are married
CORPORATION			
Father	$10,000	$2,096	$1,636
Son	10,000	2,096	1,636
Corporation	2,000	600	600
Totals	$22,000	$4,792	$3,872
PARTNERSHIP (or Corporation with total income paid out in equally divided salaries)		Compare all totals	
Father	$11,000	$2,436	$1,888
Son	11,000	2,436	1,888
	$22,000	$4,872	$3,776

Once a corporation is set up, though, dissolution will usually involve some income tax. The fair market value of the assets distributed to the stockholders will have to be compared with the cost basis of the stock. The cost of the stock is usually found to be less than the value of the assets, particularly if no tax was paid upon incorporation.

The actual steps to incorporation are:

a) Articles of incorporation and by-laws are drafted;

b) These articles and by-laws are then filed with state and local officials;

c) Any amendments passed later must be similarly filed.

After the corporation is in operation annual meetings must be held and reports made to the state and the payment of certain salaries, wages and rents must be reported.

The laws governing corporations vary from state to state, but a glance at the New York law will reveal some typical items. In New York any three persons may form a corporation for a lawful business purpose. All it takes to start the ball rolling is to file a certificate of incorporation with the Secretary of State. This certificate, which must be drawn up by an attorney, must state the name, purpose, and location of the corporation; the amount of capital stock, par value of the shares and addresses of the directors and of each person who signs the certificate of incorporation and the number of shares of stock each of these subscribers is taking. It must be certified that all the subscribers are of full legal age, that at least two-thirds are citizens of the United States and that at least one director is a citizen of the United States and a resident of New York.

The costs of incorporation, too, will vary with the state. In New York they are:

a) An organization tax of 1/20 of one per cent of the amount of the par value of all shares with a par value, or 5 cents on each share without a par value. For a business of $100,000 this would amount to a tax of $50.

b) A federal stamp tax on the stock at a rate of 11 cents per $100 of face value and a comparable rate for stock without par value.

c) State and Federal taxes on the transfer of stock. These are about half as high as the taxes on the issuance of stock.

d) A fee of $40 for filing of the certificate with the Secretary of State.

e) Finally, there are the attorney's fees. No estimate can be given here, the fee, of course, depending entirely upon the amount of work involved. Many bar associations suggest a minimum fee of $150. Usually the total cost of incorporation including taxes and attorney's fees will run from about $300 up.

Earlier we mentioned Professor Miller's plan for using the corporation as a means of attracting capital to agriculture. Now that we have covered the details of incorporation itself, let's consider the Miller plan.

Miller, like others who have faced the problem squarely, is concerned with the fact that 56 per cent of all American farmers —the operators of 2.7 million farm units—lack the capital to do a good job of farming. As he analyzes the capital demands of

For the really big jobs the new 6-ton NEW IDEA heavy-duty wagon will stand the gaff for years. Has perfect trailing qualities proved on the highway under maximum loads.

6 tons big and twice as tough!

New heavy-duty New Idea wagon engineered with maximum strength, extra wide tread, expandable wheelbase

At last, here's the kind of 6-ton heavy-duty wagon every farm needs for those king-sized jobs—a product proved on NEW IDEA's new engineering torture-track.

Proved tougher. This new 6-ton NEW IDEA wagon is only called "toughest in its class" after going through weeks of frame-twisting, jolting punishment on the company's test "torture track." After weeks of destruction testing — equal to years of hard farm use— the wagon was damaged. Then, widely-known makes of wagons of similar size were put over the course with the same load. NEW IDEA outperformed them all. Maximum strength has been built into every point of stress in this rugged new wagon.

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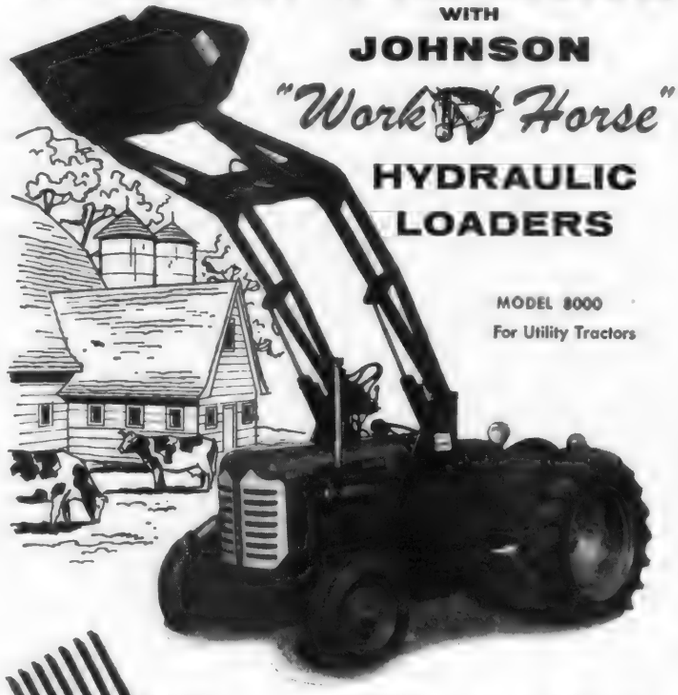

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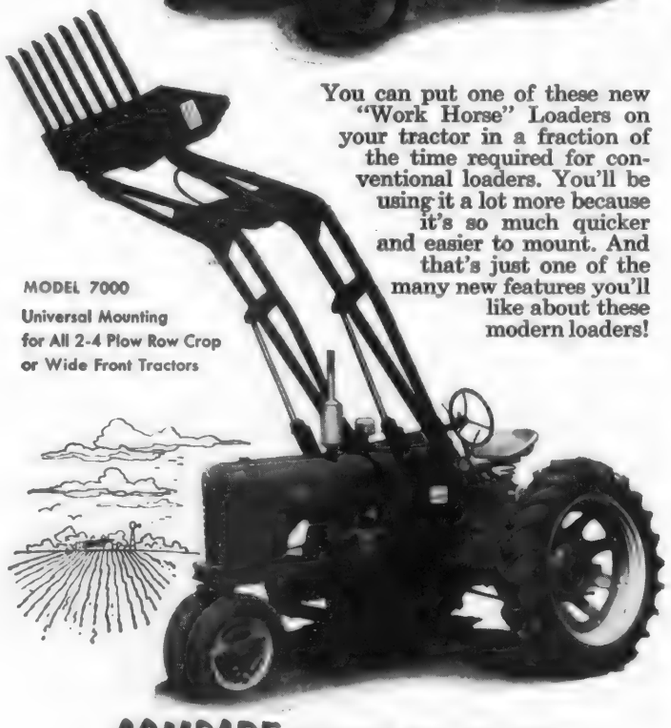

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modern farming the efficient owner operator must be able to supply 35 to 50 per cent of an investment of $20,000 to $30,000 for each man employed on his farm. The balance of the funds has to come from loans bearing a fixed rate of interest and the investment is subject to much higher risks than in the days of subsistence farming. Our present system of finance just is not geared to do the job.

Many of the farm units Miller has in mind are too small to keep modern farm machinery running a sufficient number of days during the year to achieve low operating costs per acre or per hour and they cannot produce enough without such machinery to earn satisfactory incomes. Expansion of these units into efficient enterprises can only be achieved through two factors, (1) finance, and (2) capable management of the reorganized business.

The corporation, says Miller, is just the thing for this assignment and here is how he would use it.

A company would be organized to buy up a number of farms —25 would be the minimum—in a relatively small area. Funds for the operation would be obtained through the sale of common stock. The farms would be combined into a number of efficient operating units, each with enough good land and working capital for full utilization of family labor, and good management would be assured through supervision by well trained managers who would be the employees of the corporation. The farms would be leased to tenants under standard leases.

The corporation would issue two tyypes of stock, Class A and Class B. Class A stock would represent an equity in the entire firm. The owner of Class B stock would hold rights in some particular farm owned by the firm. Each tenant would have the privilege of purchasing Class B stock in the farm he operates and when he owned enough of it to give him sufficient equity for a loan from the Land Bank, an insurance company or other lending agency, he could redeem his Class B stock and buy the farm business. And the term "farm business" is of the utmost importance here for it would be the entire business that would be sold as a well balanced unit rather than land and improvements as real estate and the livestock and equipment as chattels.

The corporation contemplated in this plan would have as its primary functions the furnishing of risk capital and helping farmers with their management problems. It would not be corporation farming in the sense in which that term is now used, often with an adverse connotation. Rather it would be a scheme for corporation financing of family farms. It would serve to strengthen the rural community rather than introduce "factories in the fields."

Miller points out that there would be at least four direct benefits of the plan. First, it would contribute to the development of management skills in young operators who would work under the guidance of highly qualified managers.

Second, it would bring about the much needed enlargement of existing farm businesses.

Third, it would provide a simple method of transferring property to the next generation, a point already considered.

Fourth, it would provide a natural investment outlet for the older farmer who is ready to retire and who could exchange his farm business for stock in the corporation plus enough cash to permit him to buy a small place in town.

Miller is aware of the fact that stock in a corporation of this type is something less than a top investment attraction, yet he feels there is the possibility of showing a good return on the stock. He points to a farm in central Missouri as a good example of what could be accomplished under this plan. Here the operator started in 1946 with no investment, but had accumulated $6,300 out of his share of the earnings by the end of 1954, after deducting an average of $1,470 per year for family living expenses. The corporation's share of the net farm income after deducting 20 per cent for overhead and management expenses would have permitted it to pay dividends at the rate of 6.2 per cent on the total value of the business. Miller feels that good management could make these returns average out at an acceptable rate through good years and bad.

Launching the plan would take a tremendous amount of capital. Figuring an investment of $50,000 per farm and starting with

25 to 50 farms would require a total of $1.25 million to $2.5 million in the way of starting capital.

Where to get it? Miller suggests that maybe one of the Foundations could be interested in putting up the capital for a 15-year period with repayment privileges at any time. The stock could then be offered to investors and the money returned to the Foundation as rapidly as it is subscribed.

Or, possibly a number of insurance companies which deal in farm loans could each turn a farm over to the corporation for use during a 15-year period. Again, as stock was sold the insurance companies would be reimbursed.

Or, an equity financing division might be organized in the Farm Credit Administration.

Will it work? All that can be said is that it is a new departure in farm financing, a field that is wide open for new ideas. How many would have gone for the corn combine 10 years ago?

But whether or not the Miller plan ever becomes a reality, the corporation is a form of business organization which promises to play an ever more important role in the affairs of the American farmer. As a means of passing the farm along to the coming generation, for assembling or conserving capital for the expansion of the business, and for meeting certain difficult tax problems, it is a tool many farmers will want to use.

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USS NATIONAL **Polyethylene** PIPE

UNITED STATES STEEL

Tree Talk

by

Will Rusch

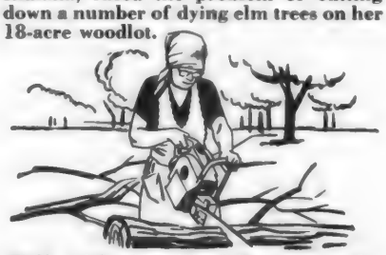
Way back when, I remember my dad telling me "Money doesn't grow on trees" whenever I tried to convince him I needed some extra folding stuff.

Well, the notion that "money doesn't grow on trees" may have been true then – but it certainly doesn't stand up today, thanks to the tremendous growth of tree farming and the recently enacted Soil Bank program.

As a matter of fact, I don't know of any place this side of the U.S. Mint where money is produced surer or steadier than on a Tree Farm. Apparently, more and more farmers feel this way too, because hundreds of them are turning their marginal and excess croplands to trees every month. By actual count there are more than 8,500 Certified Tree Farms in the U.S., an increase of 35 per cent since 1954!

If you're interested in this profitable program, you'll find lots of helpful data on tree farming at your nearest McCulloch dealer's store. McCulloch dealers, you know, are taking an active part in the Tree Farm movement by working with the American Forest Products Industries in making their stores available as information centers.

Any remaining thoughts I might have harbored that it's a man's world were rudely dashed recently upon hearing of a remarkable woman named Mrs. Flora N. Thomas. Seems that Mrs. Thomas, who manages a 140-acre farm at Plainfield, Indiana, faced the problem of cutting down a number of dying elm trees on her 18-acre woodlot.



Well, with the aid of her son and a McCulloch chain saw, Mrs. Thomas cleaned out the old elms, used some of the wood to heat her 7-room house and sold the rest for $300!

Says Mrs. Thomas, "My McCulloch saw has given splendid service with very little expense. We could not be without it. Every farmer should own one."

Oh, I almost forgot . . . Mrs. Thomas who handles her McCulloch Model 33 like a logger, is a hale and hearty 68 years of age!

If you haven't already done so, I suggest you send me a postcard today for your free copy of "*How To Make Money With A Chain Saw*," an illustrated booklet we've just issued that you're sure to find helpful in cutting and tending your trees. Just write to me, Will Rusch, McCulloch Tree Topics Bureau, 6101 W. Century Blvd., Los Angeles 45, Calif., and I'll get it in the mail to you promptly.

It won't be long now until McCulloch's new line of chain saws for 1957 is introduced. I've seen and used each of the '57 models and can honestly say they're terrific!

Don't take my word for it though. Visit your nearest McCulloch dealer and try one of these new McCullochs yourself. You'll be pleasantly surprised.

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SUPER-SIZED FEEDLOT

(*Continued from page* 63)

Ration No. 20 is the holding ration. Cattle being fattened for slaughter are usually started off on the number 7 ration; after 30 days they are switched to number 3 for another 30 days and are finished on number 1 for the last 60 days or switched to another ration even heavier in grain and meal.

On these rations the cattle make consistent gains of 2.3 to 2.4 pounds per day at a cost of around 25 cents a pound. Obviously, the only profit potential at present prices is in a good spread on the original weights.

"With exceptional bunches of cattle we have put on gains of 2.8 pounds a day at a cost as low as 21 cents," says Ed Tovrea, "but that is phenomenal. You can't do it right across the yards."

Ed's theory on handling cattle is simple. "Give a steer a good home," he says, "feed him a good ration and pay strict attention to buying and selling and you can forget the frills." The Tovreas tried urea as their protein source sometime back, did not like it and went back to cottonseed meal. Since they are in the center of a cotton producing area their complete reliance on the meal and hulls is not surprising. Directly across the road from their mill is the Producers Cotton Company, a big processing plant. The hulls are blown through a tube under the road to the Tovrea storage building.

Antibiotics still have no place in the ration and neither are Ed and his staff happy about the results they had with stilbestrol. "For the first two years we were real pleased with it," he says. "Then we found the cattle losing grade and taking longer to finish. It seemed to put a full 30 days on the feeding period."

Synovex is the hormone compound the Tovreas now use for their own cattle and any of those of their clients who request it. This is a combination of progesterone and estradiol which is implanted in the ear of the animal and is effective for 150 days. It costs around $2 a head, but on the basis of six months experience, Ed seems to think it is worth the price. About a third of a pound a day is his estimate of the increased gains which it can add.

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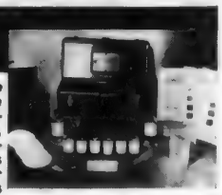

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effect considerable savings by the bulk purchase of feeds. "Not so," is Ed Tovrea's quick response. "Up to a point a man can purchase more cheaply in bulk," he says, "but when we go into the market and buy in the huge quantities we need, the effect is almost like a government support operation. Most of the time we actually pay a premium for our quality feeds rather than get any discounts."

Cowboys and Veterinarians

Death losses at the yards are almost unbelievably low, around one quarter of one per cent. This can be attributed to continual vigilance. A crew of 5 cowboys rides the corrals every morning, their experienced eyes taking quick note of any sick cattle. Early in the afternoon the veterinarian arrives and is escorted though the yards by the cowboys who rope the sick ones and hold them for treatment.

Shipping fever and Rhino Traecheitis are the two most common complaints, the latter an infection of the nasal passage which has invaded the western cattle country in the past half dozen years or so. No attempt is made at preventive treatment. Since the cowboys and veterinarians would still have to make their daily rounds, little would be saved. As it is, all droopy, sluggish, runny-nosed individuals are given immediate treatment and the results would seem to justify the policy.

Dr. Olvey says their susceptibility to shipping fever is a sure indication of what part of the country a bunch of cattle calls home. "Take those northern Arizona cattle," he says. "They're strictly country boys; never been around. Soon as they get here they get sick. Texas cattle are different. By the time they get here they've been through all kinds of stockyards and auction rings and they're tough. They can take it."

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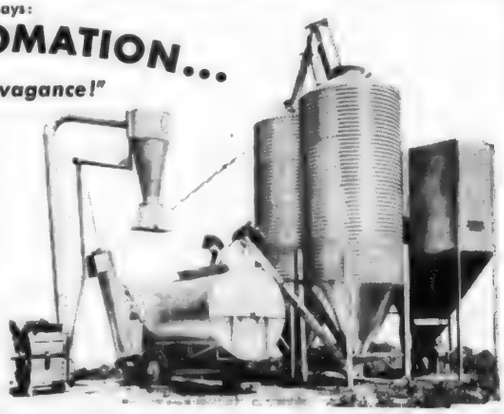

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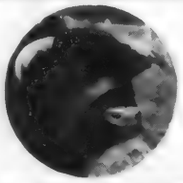

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Three to five men handle the operations, depending upon whether branding alone is to be done or whether the other operations are to be included. One man on a raised platform above the squeeze pen handles the hydraulic controls which operate the squeeze, the neck yoke, the gates, and tilt the squeeze. Others stand ready with branding iron, nippers, knife and emasculator. In short order the calves are run through and on to their pens.

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centage system. In a batch system an operator at a central control panel weighs each separate ingredient—the grain, the protein supplement, the molasses and the roughage—as it is fed into the mixer. It is much more accurate and subject to control than the older percentage system in which the components of the ration are augured together on a percentage of volume basis. Fluctuations in moisture content and density of the feed ingredients are serious drawback to accurate proportioning unless each ingredient is weighed separately.

The feed storage and mixing layout is simple enough at the Tovreas, but impressive for its size. It covers probably two acres or more of ground with its grain storage building of 13,000 ton capacity, a building for the storage of cottonseed meal and hulls, a hay building with its grinder, and a scale house and hoppers where the various mixed rations are held until they are dumped into the trucks for delivery to the feed bunks in the corrals. All these buildings are connected with the central mill and storage hoppers by an assortment of pipes, tubes and elevators. Molasses is stored in a huge underground tank. Completing the array of structures in the mill section is a maintenance building complete with all the tools and equipment needed to keep a plant like this in running order.

Corn is used in the Tovrea rations only when some rare economic twist brings it to a price as low as the milo and barley which are plentiful in the Salt River Valley. These concentrates are brought in by truck, dumped into a pit from which they are augered and elevated to their respective bins and moved by conveyor, as needed, from the bins to the roller mill.

The hay, mostly pure alfalfa, is unloaded at the hay shed where the bales are thrown on an endless chain conveyor which runs down the center of the floor. Two men remove the wire from the bales as they move along and they are then elevated to the "bale buster" and hay grinder. After passing under a powerful magnet which catches any stray hardware, the chopped hay is blown to its storage compartment. The used baling wire is wound into rolls and sold for scrap metal. An 8-foot pile of rolls is a common sight alongside the hay shed.

The alfalfa from the irrigated fields of the Salt River Valley is high quality, potent stuff, so straw plays a prominent role in the rations. Every fifth or sixth bale that goes into the grinder is usually a bale of straw to provide roughage without protein. "There is nothing like a little straw to stop the scours," says Dewey Norris.

Master of the mixing operation, Harvey Lazenby, a veteran of 18 years experience with the Tovrea organization, sits on his high stool at the mill's control panel, a confusing array of buttons, switches, lights and scale beams. Like an apothecary measuring out potions for a race of giants, he directs the flow of the ingredients from their various bins and tanks into the mixer and from there to the truck storage compartments above the scale house.

A truck pulls onto the scale, James King, another Tovrea veteran, records the tare weight, pulls the lever which allows the proper ration to drop into the truck, records the loaded weight and charges the feed to the owner whose cattle will be the recipients.

The work is completely routine. Five men, two in the hay shed, one in the grain storage building, the mill man and the scale man handle the entire job of unloading the basic materials, grinding, mixing and loading the trucks. So thoroughly does each man know his job that scarcely a word passes between them. On the back wall of the scale house is a blackboard on which is listed the number of each pen, the number of cattle in the pen, the ration being fed and the owner. So far as King is concerned, those figures are for the most part just for the record. He carries most of them in his head.

From sunrise until the middle of the afternoon the four self-unloading trucks, each with a four-ton capacity, make their rounds from the scale to the pens and back again. In less than ten minutes they can deliver their load of feed to the farthest part of the yards, deposit it in the concrete mangers, and return to the scale. The bunks are filled but once a day.

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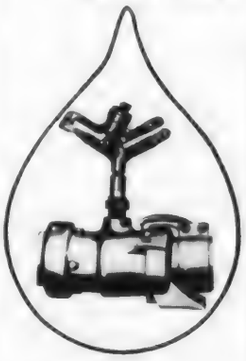

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Finkie's Fact File

by M. W. Finkenbinder

THIS DANUSER DIGGER LOVES PUNISHMENT!

1. ALLOY STEEL GEARS "TAKE IT" WITH HEAVY LOADS!
2. SHEAR BOLT ELIMINATES COSTLY REPAIR BILLS!
3. TOUGH, HARDENED CUTTING EDGES ARE MADE FOR ABUSE... LAST LONGER!
4. BALL JOINT MOUNTINGS INSURE AGAINST HIDDEN OBSTRUCTIONS OR "DRAG" DAMAGE!
5. NEEDS NO "BABYING"... ALL DIAMETER SIZES OF AUGERS AVAILABLE...EVEN THE BIG 24" FOR PLANTING TREES!

"Finkie" Finkenbinder is an experienced Danuser Service Director. He spends most of his time solving problems for individual farmers. That experience can help you.

FREE! "FINKIE'S FACT FILE FOR FENCING." How to build better fences at lower cost. Write today for your free copy. Please specify make and model of your tractor. Address Dept. xxx.

DANUSER MACHINE CO. FULTON, MISSOURI
"Contributing to Farm Mechanization"

Current wage scale for unskilled labor in the Phoenix area now runs around $1.25 to $1.50 per hour. Comparing the present complement of Tovrea workers with the 100 or so around the yards in 1930 shows that modern equipment is saving the company around $800 per day in labor costs. But it still costs a pretty penny to effect that saving. Ed Tovrea estimates they have over a quarter of a million dollars tied up in the mill equipment. All the machinery is powered by electricity, the hay mill alone requiring a 150 horsepower electric motor. The monthly power bill runs about $2000.

Wire cut from the hay bales is re-wound and sold for scrap.

Sale of manure goes a long way toward meeting operating expenses. The entire yards are underlaid with a granite base, a factor which turns the chore of post

setting into an engineering feat, but affords perfect paving for the pens without the expense of laying a concrete floor. The pens can be easily cleaned with power scrapers and loaders and the manure is stacked in a mountainous heap in a remote corner of the layout. Some of it is eventually moved to a retail outlet on the highway where homeowners and gardeners pick it up in sacks, baskets or trailers. The bulk is sold right at the pile where the Tovreas maintain a bulldozer and bucket elevator to load the trucks which come in to pick it up. The going price is $3 a yard wholesale, $3.75 retail.

Customer Relations

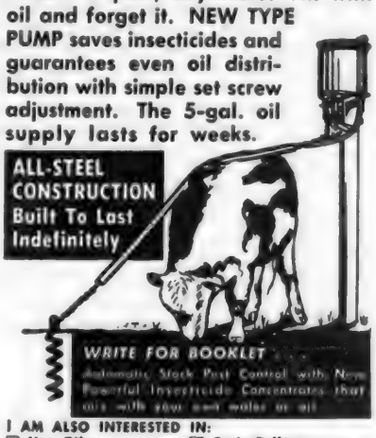
About 70 per cent of the cattle in the yards are owned by outside interests. Some are owned by Tovrea employees. Ernest Divelbiss, one of the truck drivers, for example, usually has a hundred head of vealers he can keep his eye on as he hauls feed around the yards.

The regular customers number around 15 to 20 with a turnover of 5 or 6 a year. "We make no particular effort to go after new customers," Ed says with the confident air of a man who knows he has a good property. "We don't advertise; that is, not in the ordinary sense of the word. Our building, our landscaped grounds lying right here along the highway, are all the ads we need. People, the kind of people we can do business with, know we're here and when they need our services they come to see us."

Sandhills
"CABLE-TYPE"
CURRIER & OILER

NO BRUSHES, ROPES OR FABRIC

The SANDHILLS Oiler curries while it oils. Cattle go over or under treating all parts of body. Easy to install! Attach to post, anywhere. Fill with oil and forget it. NEW TYPE PUMP saves insecticides and guarantees even oil distribution with simple set screw adjustment. The 5-gal. oil supply lasts for weeks.



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☐ Power Sprayers ☐ Feed & Molasses Mixes
☐ Cattle Neck Chains ☐ Tractorkabs

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AUTOMATIC EQUIPMENT MFG. CO.
3917 NO. MAIN STREET PENDER, NEBRASKA

UPDATE YOUR TRACTOR POWER

M & W Live-POW'R PTO Gives You All These Power Advantages

1. With Live-POW'R on your Farmall tractor you can chop three loads of alfalfa in the same time it used to take to chop two loads.

2. Your baler won't slug. You'll bale right through the heaviest swaths, saving time, money and effort.

3. Eliminate auxiliary engines. Buy PTO-driven balers, choppers and combines. You'll save plenty of money on this feature alone.

4. Live-POW'R does away with 90% of the normal shifting, reshifting and foot clutching on Farmall tractors.

5. You'll be able to put two swaths of alfalfa and brome together. Cuts your hay chopping time by one-third.

6. If you do a lot of grinding M&W Live-POW'R will take the full horsepower of the engine—won't weaken the PTO shaft.

7. An M&W Live-POW'R on your tractor permits a creeping speed to pick up down corn without leaving ears in the field.

8. M&W Live-POW'R unit will clear all of your mounted equipment. You'll never want to be without it. It has all the advantages of a separate hand clutch.

9. Live-POW'R clutch makes your older Farmall perform as well as newer more powerful models. Saves tiring footwork and lessens clutch wear.

M&W 2-WAY, 1-WAY LIVE HYDRAULIC SYSTEMS GIVE INSTANT HIGH PRESSURE CONTROL

If you want fast, high pressure control independent of transmission clutch and pto, ask your local tractor dealer to install an M&W Live Hydraulic System. This system gives immediate power, continuous one-way or two-way operation and greater capacity. Installations available for Farmall, Case, Allis Chalmers, Minneapolis-Moline and Oliver Tractors.

HAVE YOUR TRACTOR ANALYZED
With the new Hydra-Gauge Dynamometer your M&W dealer can restore peak power, efficiency and fuel economy to your tractor in 15 minutes. You can see the difference before your very eyes.

AMAZING LIFETIME OIL FILTER
M&W's new Add Life Oil Filter never needs replacing. Millions of tiny bronze balls filter tractor oil clean. Send for free folder.

At Better Dealers Everywhere
M&W TRACTOR PRODUCTS
3905 Green Street Anchor, Illinois

for more PROFITABLE IRRIGATION always specify FLO-MOR PIPE by HABCO America's Leading Producer of Highest Quality Roll-Formed Aluminum Tubing

for GATED or SPRINKLER SYSTEMS

HABCO . . . FIRST in the nation in roll-formed aluminum tubing production capacity; more than 250,000 feet per day

HABCO . . . FIRST in the midwest in range of diameters offered—3-inch through 10-inch

HABCO . . . FIRST in quality; new welding process makes possible highest quality in the industry

HABCO . . . FIRST to offer a thin wall, roll-formed aluminum tubing which proved most acceptable to the sprinkler irrigation industry; SIA specifications for extruded tubing now being discarded in favor of equally strong thin wall tubing

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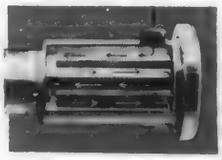
STRONGER LIGHTER IN WEIGHT CORROSION RESISTANT

FOUR GATES AVAILABLE

Easy to install; adjustable; withstand maximum pressure; no leak. Plastic tubing connections available for use with Types 1 and 2

TYPES 1 and 2

TYPES S-100 S-200



NEW COOL-MOR ALUMINUM HEAT EXCHANGER *for Cooling irrigation engines.*

Eliminates need for radiator and fan, thus increasing engine efficiency. Shorter in length (one-third that of steel heat exchangers), lighter in weight and less costly because of aluminum's faster cooling action.

See your dealer or send coupon

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Dept. Q-8 Columbus, Nebraska

Please send information on
☐ Pipe ☐ Gates ☐ Heat Exchanger

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America's Pioneer and Leading Manufacturer of Crop Drying Equipment

Most of the Tovrea clients are local people who are able to keep a sharp eye on the market and do their own buying and selling. The company takes no responsibility for marketing the finished cattle. That matter is left strictly to the owner.

The questions are frequently asked: "Why would a feeder patronize a yard like this rather than feed on his own place? What might be the prospects for an operation like this in other parts of the country?"

The answer to the first question is that it enables a man to cut his investment in land and equipment to zero, throwing his capital entirely into stock and feed. In some instances arrangements can even be made to carry the feed charges until the cattle are sold. It also relieves him of any personal labor or of hiring labor. Certainly these inducements would not prove equally attractive to all cattle feeders, particularly not to the highly skilled and experienced man whose feeding operations give him the opportunity to capitalize on his own skills. But there is many an operator who would welcome the chance to get away from the mud and cold and the day-in, day-out responsibilities of feeding as he has known them all his life while at the same time being able to retain his interest in the business and cash in on his knowledge of cattle and his trading ability.

What the prospects are in other parts of the country is a question for a few enterprising individuals to answer. As Ed Tovrea sees it, "There are three primary reasons we are in business here. First, we are right in the heart of a rich feed producing area; second, we are close to the source of supply for calves and feeder cattle; third, we have good markets for the finished beef and veal. Add to this the fact that we are in a dry, warm climate and it all stacks up to a very favorable situation. The Los Angeles market is our biggest outlet but we sell to the Phoenix trade, too, and a good percentage of our stuff is beginning to move into Texas and Colorado."

The Southwest is not the only spot

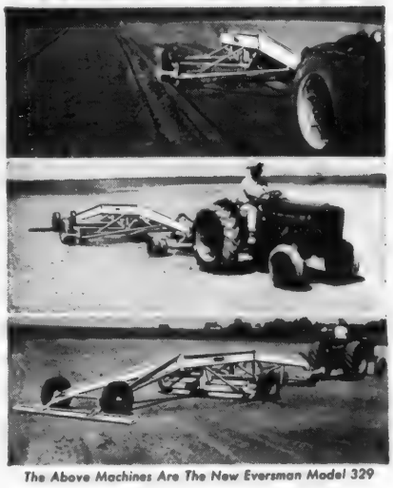
COUGHS DUE TO COLDS

among horses, mules, cattle, sheep and dogs call for treatment with SPOHN'S COMPOUND. A stimulating expectorant. Acts on throat and bronchial tubes to hasten relief. Used by world-famous horsemen for 55 years. At drug stores, or direct, postage paid, $1 & $2.
SPOHN MEDICAL CO., BOX 14, GOSHEN, IND.

SPOHN'S COMPOUND
FOR COUGHS DUE TO COLDS

Moisture Management and LAND SMOOTHING WITH AN **Eversman** LAND LEVELER and DIRT MOVER

Greatly Increase **YIELDS PER ACRE**



The Above Machines Are The New Eversman Model 329

Eversman engineered fields mean more profits for farmers through greatly increased production per acre. Now the average farmer with his own tractor and at low cost can—

1 Shape fields by grading down high spots, filling in low areas and pot holes that gather water and drown out crops.

2 Build farm-over drainage ditches or grass water ways when needed to get excess rainfall off the land quickly.

3 Increase production on irrigated land. Smooth level surfaces free of pockets, dead furrows and back furrows result in great savings in labor and water with every foot of ground producing uniformly.

4 Produce a better seed bed. The Eversman with spring-tooth attachment is a complete TILLAGE TOOL which produces better seed beds at lower cost. For more details send for the two booklets shown below.

There are 7 all purpose (mechanical or hydraulic) Eversman Models for all standard farm tractors . . . for Automatic Land Smoothing, Dirt Moving and Seed Bed Preparation.

EVERSMAN MFG. CO.
DEPT. 7 • CURTIS AND FIFTH • DENVER 4, COLO.

see page 156

where these super feed lots are thriving. The demands of the California markets have made them a reality in that state, too, as well as in Idaho and Colorado from which points cattle can be shipped quickly to the packing houses on the Pacific coast.

Principle drawbacks in the Midwest would seem to be the weather—weather-proofing a yard of 50 acres or more for year 'round operation of trucks and dozers would in itself require a tidy investment — plus the distance from the source of cattle supply. Lack of markets for pen-fed veal would also restrict the operation entirely to the feeding of heavier cattle.

Availability of equipment is no problem at all. There are already several firms in the field which make, install, and service these oversized mills and mixers, among them the John W. Williamson Company of Montebello, California, the Keith Engineering Company and Western Engineering Company, both of Los Angeles, California, the Hays and Stolz Company, Fort Worth, Texas, and the Sprout Waldron Company of Muncy, Pennsylvania.

ALL ABOUT GRAIN DRILLS

(*Continued from page* 67)

The ridges have the further advantage of gathering the winter moisture and holding it in the rows.

Most makes of drills are available in straight line or stagger arrangements of the openers, whether they are disks, hoes or lister shoes. The stagger arrangement allows the drill to operate in trash or rough ground with a minimum amount of piling up ahead of the openers.

The Right Quantity

Grain drills have metering and speed control devices for regulating the flow of grain seed. Settings are determined from seed charts furnished as regular equipment on all drills. They also have a land measure for determining how much acreage is worked. These are usually accurate enough for ordinary work, but if a farmer wants to check exactly what his drill is putting out, it can be done without too much work. Fill a grain drill with seed, then run it around in the barnyard with the feeds closed until the grain has settled well in the box. Then refill the box level full. Now run it over a measured acre of land with the feed set for the desired amount. Then refill the grain box to the level full position, noting how much grain was used. If this is done over several acres at several settings, the drill can be checked and the stands and yields can be further checked to see what the best seeding rates are for the soils and moisture conditions. Weight and size of seed sometimes cause considerable variation from the setting indicated by the seed chart.

The Fertilizer Attachment

In many parts of the West where the soils are rich and the only limiting factor has been moisture, the standard grain drill is the only kind of drill a farmer knows. In the Midwest and East the fertilizer attachment has been used for many years. Fertilizer attachments can be added to a straight grain drill, and this is being done in many parts of the West as soils are being depleted of their natural mineral content. The rate of fertilizer application can be varied with levers, and by using the high analysis types, an abundant band of plant food can be spread right where it is needed most by the young grain and grass plants. The feed that takes the fertilizer out of the box into the tube is usually a gear-driven star-shaped plate. On some new drills a vertical feed is being used; this gives a positive movement through the entire depth of the box.

There have been a number of experimental model drills rigged for liquid fertilizer application. This year will see several of these introduced in areas where liquid fertilizer is popular. The design of the hoe and lister openers make them good applicators for liquid fertilizer.

Digest advice 'pays off'

(in more ways than one)

Here's Andrew Dolence, Route 1, Box 106, Hopkins, Minnesota. Mr. Dolence, a client of the DOANE AGRICULTURAL DIGEST, says:

"I would like to tell you how much I appreciate the service you offer the farmer for such a low cost.

"Twice a month, your Digest brings the very latest developments in agriculture, which is so important in this ever-changing business.

"It is the best farmer's encyclopedia, very useful for any type of farming. It should be found in every farmer's home, close at hand, to be used, and not only looked at.

"The report we like best is the monthly 'When to Sell and Buy.' Other impartial reports on new equipment, the very good specifications in motor oils, the caretaking of farm machinery—are also good.

"Others we use are labor-saving tips on farrowing stalls, farrowing pigs and in feeding hogs. The information provided for figuring and feeding tables of livestock is good and we use it in cooperation with the instructions given through the Dairy Herd Improvement Association."

Would you like to read several reports Digest clients are now receiving? Some of them discuss hogs, cattle, sheep, dairying or poultry. Others deal with corn, soybeans, wheat, cotton, eggs, fertilizer, machinery or other subjects of vital interest to you. We want to prove that the Digest will "pay off" for you, too. Write today for . . .

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"America's Agricultural Authority"

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TEN YEARS FROM TODAY...

this AMES LO-HI IRRIGATION PIPE will still be "finest in the field"!

Sure, you're planning to irrigate this year . . . and unless the weatherman plans his rain around your crop requirements, you'll be irrigating every year from now on.

That's why your irrigation system should be planned for the future . . . built to take the beating that comes from constant coupling, moving and storing. That's why your choice in surface irrigation systems should be Ames Lo-Hi pipe!

Lo-Hi aluminum pipe is formed by an exclusive Amesweld process which gives built-in reinforcement in the weld itself. Aluminum lightness means it's easy to move . . . aluminum durability means it will be operating efficiently *ten years from today*.

Lo-Hi pipe is protected on *both* ends by sturdy steel couplers that just don't get dented or knocked out of round . . . couplers that give you easy, watertight connections after years of field duty.

Lo-Hi gated pipe features the famous Ames Flo-Control gate . . . leakproof, weatherproof Neoprene frame makes it easy to adjust or replace . . . recessed gate construction eliminates damage in handling . . . graduation markings give you exact settings for controlled furrow irrigation.

Sure, you're planning to irrigate this year—because irrigation has been proved by bigger, top-quality harvests. But be sure to buy the system that will bring you these benefits this year . . . and ten years from today: Ames Lo-Hi irrigation.

Ames makes irrigation systems for all watering methods. Ask your Ames dealer about ABC Sprinkler Systems, Tow-A-Line and Wheel-O-Rain mechanical moves.

AMES "Profit-Planned" IRRIGATION SYSTEMS
Established 1910

W. R. AMES COMPANY — MAIL THIS COUPON TODAY!

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Please send me free literature about Ames Irrigation Systems. I am interested in ☐ surface irrigation ☐ sprinkler systems ☐ mechanical moves.

NAME _____
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CROPS _____ ACRES _____

Lifts and Hitches

Three types of lifts (to bring the openers out of the ground for transport) are usually available from the manufacturer: hand levers, power lifts using a rope and plow clutch, and hydraulic lifts for use with a tractor hydraulic system. Drill hitches are made with various types of attaching linkage to hook them to tractor drawbars. Two-drill hitches are available, factory made, from most manufacturers. In parts of the country where more than two drills are hitched to big tractors these multiple hitches usually are made by local machine shops. Three-point hitches are supplied with the integral drill which has no wheels of its own.

The Integral Drills

The integral drill is also known as a three-point hitch drill. It has no wheels of its own but is maintained in position for planting or transportation by the hydraulic lift of the tractor. It has

AVERAGE RATES FOR SEEDING GRAIN

GRAINS	lbs./bu.	Rate lbs.	Rate pecks	Rate bu.
Barley	48	48-72	4-6	1 -1 ½
Buckwheat	48	36-60	3-5	¾-1 ¼
Cow Peas	60	30-45	2-3	½- ¾
Field Peas	60	60-120	4-6	1 -2
Flax	56	25-50	2-3	½- ¾
Grain Sorghum	56	7-12		
Oats	32	64-96	8-12	2 -3
Rice (In rough)	45	90-150		
Soybeans	60	45-75	3-5	¾-1 ¼
Vetch	60	50-80		
Winter Wheat	60	25-60	2-4	½-1
Spring Wheat	60	60-90	4-6	1 -1 ½
Durum Wheat	60	90-105	6-7	1 ½-1 ¾

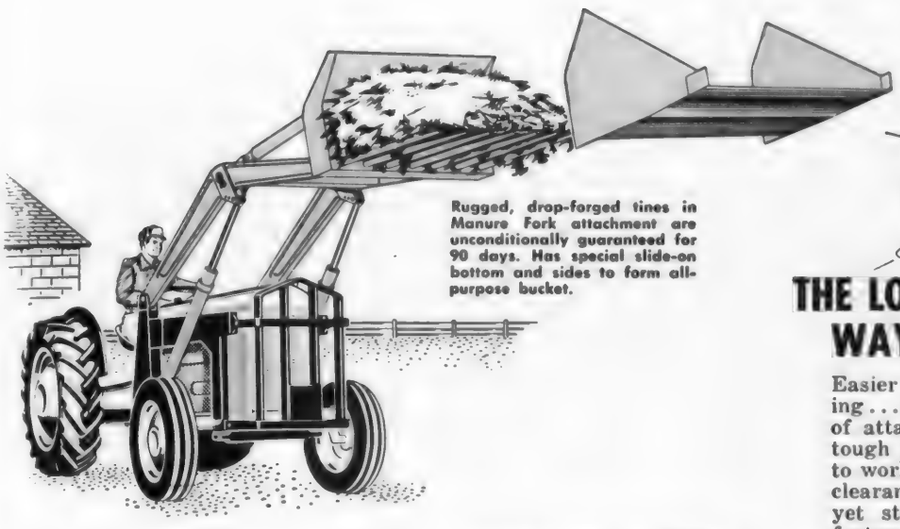
certain inherent advantages such as maneuverability, speed, easier transport and fewer parts, because it has no running gear. Normally it will cost less. There are also limiting factors. Because it uses the tractor as a platform there is a limit to the size and weight of the drill and the working load of grain and fertilizer that can be carried. When it is off the tractor it should be set on a stand. The All-Crop drill designed by Allis-Chalmers is the most widely used integral drill. It has a twin boot that drops the seed and fertilizer in side-by-side bands between a double-disk opener. The feed for the seed is of a new vertical rim type, closer to the double run feed in design than it is to the fluted feed. The fertilizer feed has spiral steel agitators which break up the fertilizer and force it out of the hopper. Grass seeding is done by the band method. This drill has 7-inch spacing between openers and comes in 75-inch width for the 2-3 bottom tractor and 89 inches for larger tractors. It takes its power from a chain attached to a sprocket on the tractor rear wheel.

Spacing the Rows

Drills are supplied with disks spaced to give rows of 6, 7 or 8 inches apart. A 10-inch spacing is often used on deep furrow drills and 12- or 14-inch spacing is used on lister drills. On the lister drill, the grain is spread in a band up to 4 inches wide so that the actual rows are 8 to 10 inches apart.

The Grassland Drill

For the past two decades the Soil Conservation Service has encouraged the use of all-year pastures and all-year cover of the ground in the South and Southwest. Down there a new type of machine has been developed to do the job of drilling in pastures without plowing the sod or grass. It is called a "grassland drill," a specially designed, heavy machine that will cut its way through sod or pasture grass and plant oats, rye or other grain seeds in it. It is usually used in the late summer or fall when the sod is dormant—August or September. The fertilizer is cut into the grass 3 or 4 inches with a heavy coulter and a shoe type of opener. The soil drops back over the fertilizer and the grain is dropped into the slit. Grass or legume seed is band seeded near the surface of the ground.



Rugged, drop-forged tines in Manure Fork attachment are unconditionally guaranteed for 90 days. Has special slide-on bottom and sides to form all-purpose bucket.

DISCOVER DAVIS

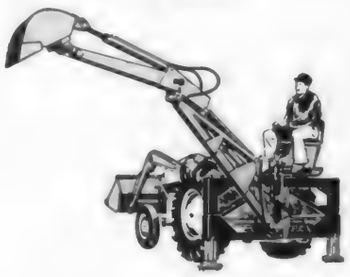
THE LOADER THAT POWERS THE WAY FOR EASIER FARMING

Easier farming . . . more profitable farming . . . all yours with a Davis Loader. Dozens of attachments let you handle hundreds of tough jobs easily and efficiently. Designed to work in tight corners allowing maximum clearance and visibility. Greatest strength, yet streamlined design. Now even more features . . . long-lasting valve, heavier-duty pump drive and mounting, ram shafts that won't dent or peel . . . all for better performance and to make it last longer than any loader at any price. It sets the pattern in design, but has never been duplicated in performance. Compare it and see.

DAVIS Products are available for most popular makes of tractors . . . and are sold anywhere in the U. S. and Canada by better dealers.

DAVIS . . . *The World's Most Wanted* BACK-HOE

The Model 185 Davis Back-hoe has new comfort design. Ideal for digging laterals, septic tanks, footings, and other custom work. Works at right angles to clean ditches, canals. Detaches in five minutes. Still priced less than ordinary back-hoes.



MID-WESTERN INDUSTRIES, INC.
1009 SOUTH WEST STREET, DEPT. F WICHITA, KANSAS

Please send me literature and name of dealer for a Davis Loader____ Davis Back-hoe____ to fit a_____ tractor.

NAME_____

ADDRESS_____

TOWN_____ STATE_____

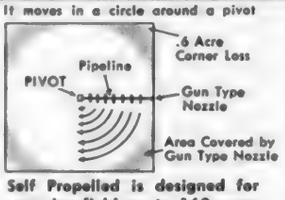
If oats or Balboa rye are seeded in August in dormant pastures planted to grasses like Bermuda, Bahia or Dallis, the winter pasture of oats or rye is ready by October or November. If this is grazed until March, then the animals removed, a grain crop can be harvested or made into hay or early silage in April or May. The band-seeded legume or grass has then had a chance to get started and it follows along after the grain is removed to give a productive, early summer pasture.

Although the Grassland Drill has been used in the South and Southwest, it is only a question of time until it will make its way into the North. Several of these drills are now being used by dairy farmers in Wisconsin to seed for late fall and early spring pastures. Because of its ability to plant without seedbed preparation it is well adapted to over-seeding and fertilizing steep slopes where plowing would open the land to erosion. The most popular sizes are the "5-20" (5 applicators, 20 inches apart) and the "7-10" machines. The seed box is about 6 feet wide and the over-all width of the Grassland Drill is about 8½ feet. It requires at least a 3-4 bottom tractor to pull it. It will cost in the neighborhood of $1000, fully equipped.

This rugged new member of the drill family makes it possible to seed a wide variety of uncleaned grains and sow grass and legumes without exposing a seed bed to erosion or wind blowing.

Irrigations *only* EASY WAY
Automatically, Without Labor, Unattended

It moves in a circle around a pivot



Self Propelled is designed for any size field up to 160 acres and more. Get the full facts before installing hard-work systems.

Self-Propelled System irrigates 160 acres or more without Moving Pipe

This Amazing Without-Work System Gives You All These Advantages—Irrigate high crops as easily as low ones, whether ridged or hill planted. Irrigate frequently — give 40 acres 1" in 40 hours or 160 acres 1" in 80 hours. Give up to 4" of rainfall at a single setting. Irrigate 'round the clock, night and day, and unattended. Irrigate without labor — just press a button. No more moving pipe. Economical — costs no more, or even less, than conventional methods in many, many cases.

VALLEY

Write today for your free illustrated booklet that gives all the details on Irrigation's Only Easy Way.

Valley Manufacturing Co., Valley, Nebraska

Irrigate?

It's a matter of dollars and cents. Maybe you can't afford not to.

Your nearby Fairbanks-Morse or F-M Pomona pump dealer is an irrigation expert. He has the answer to your question: "Will the greater yield pay for the water and leave more cash profit in my pocket?"

Chances are, the extra profit will be plenty.

And when you irrigate, your best buy is the *best* pump. Fairbanks-Morse pumps and motors are exactly right for all types of irrigation, pumps with designed efficiencies that will cut your irrigation power bill, quality pumps that will cost little to maintain.

Mail the coupon today for complete illustrated literature, and the name of your nearby Fairbanks-Morse centrifugal pump or F-M Pomona Turbine pump dealer. Fairbanks, Morse & Co., Chicago 5, Ill.

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a name worth remembering when you want the BEST

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☐ Send me literature on irrigation pumps.
☐ Send me the name and address of my nearest F-M pump dealer

Name.....

Address.....

City or Town.....

State.....

Press Wheels

Press wheels can be attached to any drill and they will do a good job in a dry climate or in any of the Midwest areas if there is a dry spell after the seeding. Their action is similar to that of a cultipacker. When a drill is equipped with press wheels a trip over the field with a tractor and cultipacker is saved. With a standard drill the seeds that are dropped in the ground and covered by the drill chains may still have a battle for life, if the ground is loose and there are air pockets beneath the seeds. The tender young roots sprout and reach down for moisture and nourishment. If they hit an air pocket, with its drying effect, they are goners. Press wheels may be of spoked steel, solid steel, semi-pneumatic rubber on steel, or they may be old auto tires mounted on rims and an axle. To be effective, press wheels should apply 10 to 20 pounds per square-inch pressure on the ground either by their own weight or by spring pressure. Also they must be set so they track directly over the band of seeds.

AVERAGE RATES FOR SEEDING LEGUMES AND GRASSES

SEED	lb./bu.	Rate lbs. per acre
Alfalfa	60	6-10
Bermuda	40	5
Birdsfoot Trefoil	60	5
Blue Grass	14	8-10
Brome Grass	14	10
Common Millet	50	15-20
Clover, Alsike	60	3-4
Clover, Crimson	60	5-10
Clover, Ladino	60	1-2
Clover, Red	60	3-6
Clover, Sweet	60	15
Clover, White	60	10
Fescue	25	10
Lespedeza, Kobe	30	10-20
Lespedeza, Korean	45	10-20
Lespedeza, Sericea	60	15-20
Orchard Grass	14	3-10
Rape	51	3-5
Red Top	14	3-4
Reed Canary Grass	48	8-10
Rye Grass	24	10-15
Sudan Grass	40	5-10
Timothy	45	6-8

The action of the press wheel is to squeeze out the air pockets and put the seed in contact with the moist earth. When the press wheel smooths the soil above the seed it helps conserve the moisture, too. Comparison plantings with and without press wheels on the same fields have shown 5 to 7 bushel increases in yields where this accessory has been used in low rain-fall areas.

The Plow-Press Drill

The hottest drill in the Northwest wheat belt is the "plow-press drill." Going across the horizon with this drill hooked up a rancher looks like he is pulling a freight train. The tractor has to be big, a 4 to 5 bottom plow size. A long hitch is used for the drill; it goes from the drawbar up and over the plow. Directly back of the plow is a pulverizer-packer, a series of "V"-shaped steel wheels which break the clods and smooth the seed-bed. Then comes the plow-press drill, which usually has large single-disk openers and can be equipped with both fertilizer and grass-seed attachments. The drill has no supporting wheels of its own, except the press wheels, which are back of the seed box. It rides directly on these; the front end is supported by the pulverizer-packer. It makes plowing and planting a once-over, high-speed operation.

Says one Montana wheat rancher, "We have a short-planting season for our spring wheat and the plow-press drills are the best tools ever developed for us. Once we can get in the field to plow we're on our way. We keep two Diesel tractors equipped with plow-press drills running 24 hours a day. We have to do it that way, for every day's delay can cost us a bushel an acre in yield. The big advantage to these drills is that they save time and

Illustrated—
The 21-inch Power Propelled Rotary by Jacobsen
One of a complete line of 14 reel and rotary mowers

New Jacobsen Turbo-cut

...Mows the Way to Easy Outdoor Living

This aero-dynamic suction-lift rotor literally draws up limp grass or flat lying runners and shears them evenly and cleanly with four razor-sharp blades, whirling at high velocity. At the same time, it will cut tall, dense weeds or stems that either stall ordinary mowers or are merely pushed over. Blades are replaceable.

A cool smooth carpet of green for your "outdoor living room" comes easy with the Jacobsen *Turbo-cut* rotary mower.

Turbo-cut . . . an engineering triumph combining a unique suction lift rotor with the Jacobsen Hi-Torque Engine . . . advances far beyond accepted ideas of what a rotary mower can do. It provides smoothness and crispness of cut comparable only to the scissor-like action of the Jacobsen reel type mower.

Exclusive with Jacobsen . . . just what you would expect from the world leader in the design and construction of fine power mowers since 1921.

See it demonstrated by your Jacobsen dealer—a reliable authority carefully selected for his experience and standing in your community. He will guide you to the right size or type of mower for your lawn. Look under "Lawn Mowers" in the "yellow" pages of your telephone directory for Jacobsen nationwide sales and service.

JACOBSEN MANUFACTURING COMPANY
Dept. FQS-57, Racine, Wisconsin

JACOBSEN JOHNSTON WORTHINGTON

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BEFORE BUYING ANY TILLER COMPARE THE AMAZING NEW FEATURES AND VERSATILITY OF

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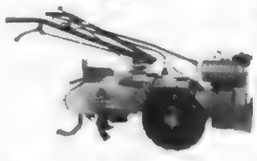
MULTIMATIC

With 2-Direction Operation Using Insta-Hitch Attachments

You've never seen—or operated—an easier handling rotary tiller than the new Ariens MULTIMATIC. Tills 16 inches wide. Has ball and cam differential for positive traction, effortless steering and instant turnaround. Handle swings horizontally 180° for use with front or rear-mounted Insta-Hitch attachments. Controls always at fingertips. See it . . . try it . . . and you'll buy Ariens MULTIMATIC!

ARIENS TILLERS FOR EVERY PURSE AND PURPOSE:

For light duty use, see Ariens Jr. rotary tiller and Ariens Yardster rotary tiller with interchangeable attachments. For heavy duty use see Ariens Trans-A-Matic tillers!



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moisture. You only have to work the soil and expose it to the air once."

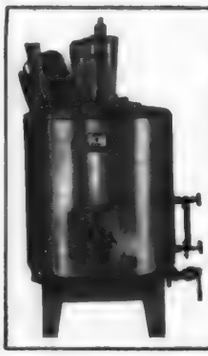
Plow-press drills come in a 4-foot size "8-6" (8 openers 6 inches apart); a 5-foot "10-6"; a 6-foot "12-6"; and a 7-foot "14-6."

In the low-rainfall areas of the country the use of other types of press-wheel drills has increased. They are made in a variety of sizes with all types of furrow openers. The big lister drills are of the press-wheel family. Most of the press-wheel drills, other than the plow drill, use a pair of rubber-tired caster wheels for front-end support. The rear support is the gang of press wheels.

Cleaning the Drill

Nothing is as important in stretching the life of a grain drill as the proper cleaning. Properly taken care of a drill is good for 25 years on the average farm; neglected, a drill is ready for the junk pile in 5 years. Says one Ohio dealer, "If the farmer doesn't have an air compressor when he buys a grain drill, I try to sell him one. Blowing the fertilizer out of the boxes, feeds, gears, chains, and bearings of a drill every night is a 5-minute job with air under pressure. If he waits until the end of the season to clean the drill he is just as likely to wait until next year. That means frozen bearings and corrosion on all the metal parts. Then he is ready for an overhaul of the drill, and that would have paid for the compressor."

The time limit for fertilizer to stay in the drill, particularly high analysis fertilizer, is 3 days. At the end of the season remove the feed wheels in the fertilizer attachment. These are usually star-type feeds or they may be vertical-type feeds. Take out the shed plates, too. Then use a water hose and squirt out all the fertilizer in the box and in the tubes. After the parts have dried out coat the inside of the box and the parts with a 75 per cent kerosene, 25 per cent machine oil mixture. Spray or immerse the star wheels and all the other parts in this oil solution. If there are areas in the fertilizer box that have lost the protective galvanizing, paint them with a good paint before oiling. Then put a grease gun on all of the grease fittings and force the old grease out and new grease in. This will carry any fertilizer away from the grease points for winter storage. Check over the grain tube and grain box and clean them



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(Meets all Local Health Codes and U. S. Public Health Service Requirements).

Available for direct steam from 25-125 gals. sizes.

Electrically Heated 25-35-50 gals. sizes.

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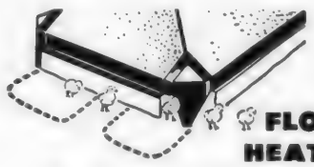
HEATING CABLE SETS
solve many farm problems

SOIL HEATING

Now it is easy and economical to have a successful hotbed or cold frame, without need for troublesome manure bedding or expensive steam or hot water systems. A General Electric heating cable set, buried in the soil, keeps the soil at the ideal temperature for germination and the early growth stages.

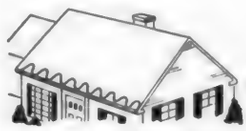


FLOOR HEATING

G-E heating cable sets for poultry brooders result in faster, healthier growth with much lower mortality. There is no crowding for heat, all chicks are in full view, feeders and waterers are easily accessible. Also ideal for floor heating in kennels and other buildings.

PIPE HEATING

The simple installation of a G-E heating cable set around exposed pipes, valves, and pumps keeps them from freezing even in the coldest weather. Typical uses are to protect piping that supplies drinking water to animals, to guard sprinkler systems in cold locations.



DE-ICING

Along roof edges and in gutters, G-E heating cable sets prevent build-up of ice dams that can cause destructive leaks when snow is melting away. Also useful for de-icing gutters and downspouts and to prevent accumulation of snow or sleet on garage aprons, walks, steps.

G-E heating cable sets come ready to install in lengths of 26, 30, 40, 60 and 100 feet with ends assembled into a weatherproof plug . . for 115 volts. Also 120-foot sets for 220 volts.

Can be used with thermostats to provide close, automatic regulation of temperature, or they can be operated by direct switching. Detailed application and installation instructions are packed with each set. For complete information, see your hardware or farm equipment dealer, or write to Wiring Device Department, General Electric Co., Providence 7, R. I.

Progress Is Our Most Important Product

GENERAL ELECTRIC

out with compressed air. Spray or paint them with the kerosene-oil mixture.

What's in the Future

Certainly one of the most likely additions to the list of jobs a grain drill can do is to apply liquid fertilizer. Complete formula liquid fertilizers that are now available in many parts of the country will make liquid nutrients easily applied close to the grain and grass seeds. Self-propelled grain drills for the big operators are in the development stage and, no doubt, will be available soon. More plastic will be used for grain drill parts. Laminated plastic is a natural for fertilizer hoppers and working parts since it is not affected by the corrosive action.

Drilling vs. Broadcasting

There are a good many reasons for using a grain drill if a farm operation is 50 acres or more; and there is only one reason against it—the initial cost of the drill. Yet figuring the savings made possible by a drill we can see how a drill will pay for itself over a period of years. For example, in sowing a low-cost seed like oats the broadcast recommendation is 3½ bushels per acre. With a grain drill 2½ bushels will do the job. Clover seed to be broadcast on top of the ground, and harrowed in, is used at the rate of 1 bushel per acre. Band seeded with a drill and fertilized it will produce good stands with 1 bushel of seed to 10 acres. Wheat and barley will produce better stands with 1 bushel to the acre drilled than with 1½ bushels broadcast.

Using a certified seed cost of $2.00 a bushel for oats, $3.00 for barley, and $4.00 for wheat, a drill will save:

	Seed Saved	Acreage	One Year	Ten Years
Oats	1 bu.	25	$50.00	$500.00
Barley	½ bu.	10	15.00	150.00
Wheat	½ bu.	10	20.00	200.00
Total		45	$85.00	$850.00

"Our *Tankmobile* Air Compressor is the best tool on the farm"

"Take our wheat drill," says William Brown of R.R. 1, Amelia, Ohio, "we spend 5 minutes cleaning it out with compressed air after we use it. We figure this kind of clean-up on our tools saves us $50 to $100 a year in repair bills, and many hours of time."

Use your portable Tankmobile Compressor to:

- Pressure-grease your machinery
- Paint your buildings and equipment
- Fog your barn to eliminate insects
- Inflate your tires for best performance and many other time and work-saving jobs

Ask your dealer to bring a dependable *Tankmobile Model 15W Compressor* over and show you how it will save you time and work.

Write for descriptive circular

CAMPBELL-HAUSFELD

181 Railroad Ave. Box 1, Harrison, Ohio

With BS & B PERFECTION You Can HARVEST EARLIER THIS YEAR...

And *Minimize* Risk Of Field Loss Or Damage To Your Crop!

Have you ever suffered damage or complete loss of a grain crop which was left standing in the field an extra two or three weeks after maturity in order to dry it down to a certain moisture content before harvesting?

Nearly every farmer has faced this problem—not once, but many times! A sudden wind storm, hail storm or rain can cause untold damage or loss at a time like that!

On the other hand, if you go ahead and harvest when the moisture content of the grain is too high, the elevator where you sell it will dock you severely. If you try to store it yourself at a high moisture content without proper equipment, it will probably spoil! How can you eliminate this problem?

Store It In BS&B PERFECTION!

Today, a good farmer also has to be a good businessman to realize the *greatest net profit* from what he produces! That is why *so many* farmers these days are putting in BS&B PERFECTION GRAIN BINS equipped with PERFECTION AERO-DRY SYSTEMS! With this combination you can harvest as soon as the grain has reached maturity, *regardless of the moisture content*, then dry it down and store it indefinitely right on your farm under a CCC crop loan, or while waiting for top market price! Furthermore, it will be completely safe from moisture, rodents, fowl and vermin!

Easily Financed Under ASC!

Short of ready cash? Then get a self-liquidating ASC loan to buy the PERFECTION BINS and AERO-DRY SYSTEMS you need under these liberal terms:

PERFECTION GRAIN BINS	PERFECTION AERO-DRY
Up to 80% Loan	Up to 75% Loan
Straight 4% Interest	Straight 4% Interest
5 Years to Repay	4 Years to Repay
100% Tax Write-Off Spread Over 5 Years	100% Tax Write-Off Spread Over 5 Years

SEE THE BS&B PERFECTION GRAIN BIN AND PERFECTION AERO-DRY SYSTEM AT YOUR PERFECTION DEALER'S NOW!

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Kansas City 26, Missouri

Please send me complete information on BS&B PERFECTION GRAIN BINS and PERFECTION AERO-DRY SYSTEMS.

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CITY_____ STATE_____

Please print

Spray apples, peaches, cherries with a big volume high velocity air stream—35,000 cfm . . . Use concentrate or dilute spray . . . Enjoy pest control at lowest cost . . . Your higher price for quality fruit pays for the sprayer . . . Also spot spray with a hand gun and high pressure stream, 20 gpm at 400 psi or 50 gpm at 80 psi . . . Spray cattle, bushes, shrubs, gardens, weeds, brush . . . Apply insecticides, liquid fertilizer, disinfectants . . . Flush stalls, pens . . . Whitewash buildings, fences . . . Clean tractors, trucks, autos . . . Put out fires.

Do it all with the 2-Fan, Hardie Duo-Fan Model DF-24B, designed, built and priced so that every farmer can have BOTH air stream and high pressure spraying in one dependable Hardie unit. Write for literature. Ask your dealer.

Hardie Rain Control gives you irrigation at the lowest cost per acre. Exclusive design, highest quality materials and precision manufacturing eliminate frequent replacement, excessive operating cost, labor and waste. The Hardie Coupler is the strongest by any test. Integrally cast 2-bolt clamp assures quick and easy attachment without pipe damage. Two hook slots give both quick detachable and semi-permanent coupling. Finest interior finish in coupler and valves assures minimum flow resistance. Design features eliminate surging. Responsible dealers everywhere. Write for literature.

HARDIE
PEST CONTROL EQUIPMENT
portable sprinkler irrigation systems
The HIGH QUALITY Line
ALL OVER THE WORLD

The Hardie Mfg. Co., Dept. Q., Hudson, Mich.
Please send me
☐ Sprayer Literature
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CITY_____ STATE_____

Saving money on seed is a help, but yields are still the pay-off. Seed planted with a good grain drill is put in the ground at a uniform depth, with fertilizer placed where it can be used, when it is needed most. This means even germination, uniform growth and all heads ripening at the same time. Experiment station tests throughout the country on drilling versus broadcast seeding showed 4 bushels more oats combined in 53 tests, 5 bushels more barley in 46 tests, 4.8 bushels more wheat in 61 tests. Better legume and grass seedings complete the cycle and with seed prices ranging from $16 to $35 a bushel, a seeding failure can be an expensive proposition. Band seeding with a drill and accurate fertilizer placement may mean the difference between producing enough winter silage and hay, or running out in March. A grain drill takes care of some of the most important operations in starting the grain and grass crops—planting and fertilizing. And a good and early start is half the battle!

THE AUTHOR: Russell H. Kerr who wrote "All About Grain Drills" is one of the best informed grain drill engineers in the country. As a Field Engineer for John Deere-Van Brunt he traveled over the entire country studying the requirements of farmers and ranchers in fitting drills to their soils, crops and climate. For the past year he has been operating a corporate farming company in Wisconsin. Mr. Kerr grew up on his family's big truck farm near Bettendorf, Iowa. He is a graduate of Iowa State College at Ames, where he specialized in Agricultural Engineering.

POULTRY YARD

(*Continued from page* 28)

privy to a place where the gray-leafed horehound bushes grew in profusion. Every pungent-smelling bush was a *maybe* for a nest. It was a thrill to find a new one, taking the eggs and leaving a glass egg. Then there were the established nests in the horehound. Four eggs here, six there. Sometimes, pushing into new territory, I'd turn up a nest of twelve or fourteen. These I left. I knew they were well on their way to becoming chicks. The greatest delight was to come upon a brood just hatched out, sans incubator, sans help from anything but mother hen. Either the mother was gentle and seemed to invite my fondling her downy little puff balls, or I'd meet up with a vicious old dame who'd lower her head, spread out her wings, and charge me.

No hunter of wild game in Africa when pursued by a lion ever got bigger goose-bumps than I did when a bad-tempered old hen chased me. I was scared, but it was fun-scared.

The next hunting ground was the long straw stack papa always kept for bedding down the stock in winter. The horses, eagerly pursuing a grain-head into the stack, made deep holes in the straw.

These were ideal for nests. Six eggs here, five eggs in another, seven eggs in still another. Once I pulled out a family of baby kittens. Another time a sleeping skunk. He was so surprised he neither bit nor sprayed, and while he was waiting for his mental block to clear up, I rolled down the stack and was halfway across the corral.

The most enchanting place was the dark coolness of the machine shed. Papa owned one of the first combined harvesters, and it was always carefully put away after harvest. Five eggs in the chaff of the cylinder house, seven on a pile of sacks in the dog house (the place where the sack sewer held out during harvest). A climb up the six or eight rungs of the ladder to the driver's seat. Four eggs there in the cotton of the torn cushion.

Outside again, a nest back of the big red open gate, among some tumbleweeds—six eggs there. Then into the barn where the horses were clanking their halter chains and switching their tails.

There was always a flock of hens here in the barn. They were the gourmets scratching in the fresh manure for choice tidbits.

Hunting eggs again. Two eggs in the curry-comb box, four in the corner of the

"FLAVORED" water is a daily cost

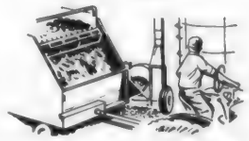
Bitter coffee, cloudy tea, unappetizing foods, all these — plus rust-spotted fabrics, clogged water pipes, heaters, boilers, and metallic-tasting drinking water — are the DAILY COSTS of rust in the water supply. These can be eliminated with a DIAMOND IRON Removal Filter. Write:

OSHKOSH FILTER AND SOFTENER CO.
Oshkosh Wisconsin

chopping is cheaper...

big capacity Gehl is lower in cost!

2-Row "Chop-All"



Hopper Blower and Self-Unloading Box

Hay Pick-Up Attachment

Chopping *is* cheaper—costs less than half as much as other forage handling methods as proved by agricultural experiment station tests. Thousands of farmers know this from actual experience. And farmers also know how much easier *fewer* men can put up *more* tonnage faster—by chopping. More of these farmers are using Gehl "Chop-All" than any other independent make. They like its rugged dependability, its high capacity performance . . . and they appreciate its lower price. Gehl dealers offer the most complete forage equipment line—and now they also give you a brand new, helpful Forage Profit Plan. Ask your local Gehl dealer to work out this savings plan for your own farm—or write and we'll mail you a copy immediately. You'll save most by chopping with a Gehl "Chop-All."

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Dept. MC-595, West Bend, Wis.
Please send my "Gehl Forage Profit Plan".....☐
Send me a Gehl catalog and Grass Silage book..☐
Advise me where and how to see Gehl's Color Movie on "Modern Forage Handling".....☐
Check if for school use.....☐
Print Name_____ Acres Farmed____
Address_____ State____

granary back of some wheat sacks. Then upon the manger, squeezing through the feed racks. Three nests on the tiptop part of the hay in the haymow. Later a scurry through the cowshed. A nest under the manger there. Another nest in an overturned barrel back of the corded wood in the woodshed.

Hunting eggs *was* a great adventure. We never kept statistics. We ate eggs boiled, fried, scrambled, in cakes, puddings and custards.

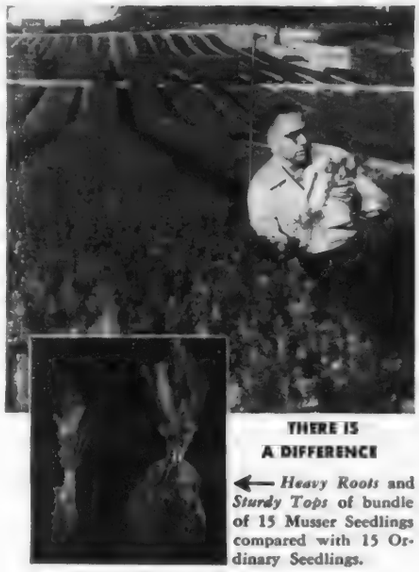
Mama traded eggs to the music teacher for music lessons for us kids. She traded eggs to the village seamstress for making our clothes. She traded them for groceries at the little country store.

I'm not trying to convince the present poultry experts to change their ways of producing eggs. I'm just trying to say it was a heck of a lot more fun hunting eggs and lots less trouble raising chickens over a half century ago than it is now. I know. I did it.

By Nan Thompson.

Poultry Efficiency Penn State has announced a new solar heated, controlled ventilation poultry house in which they are able to house birds one to a square foot, get better than 75 per cent egg production, use less than five pounds feed per dozen eggs, and enable one man to care for 9,000 birds. The cost per bird is lower than in conventional housing.

20 MILLION TREES *a year!*



THERE IS A DIFFERENCE

← *Heavy Roots* and *Sturdy Tops* of bundle of 15 Musser Seedlings compared with 15 Ordinary Seedlings.

MAKE YOUR IDLE LAND PAY YOU A HANDSOME PROFIT!

Plant Christmas Trees and Timber Crops

It pays to plant the best. There is as much difference in trees as in common and purebred livestock. Musser trees grow and thrive because of Good Heredity, Careful Selection of Seed and Scientific Culture. Don't waste time and money on inferior stock.

SEEDLINGS and TRANSPLANTS at LOW, QUANTITY PRICE — such as

	Per 1000
SPECIAL STRAIN SCOTCH PINE Very best Christmas Tree strain. From seed collected by our men from selected parent trees. Healthy, sturdy, straight stemmed, rich color.	
2-yr. Seedlings 3-6"	$25.00
2-yr. Seedlings 4-8"	35.00
4-yr Transplants 6-12"	100.00
AUSTRIAN PINE	Per 1000
2-yr. Seedlings 3-6"	$25.00
3-yr. Seedlings 8-14"	40.00
NORWAY SPRUCE—Fast growing. Seed collected by our men from selected trees.	Per 1000
2-yr. Seedlings 5-10"	$35.00
3-yr. Transplants 6-12"	65.00
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2-yr. Seedlings 4-6"	$30.00
3-yr. Seedlings 6-8"	45.00
BLUE SPRUCE—Superior stock.	Per 1000
3-yr. Seedlings 5-10"	$50.00

Write for Free Catalog..

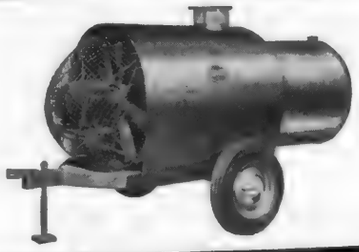
with wholesale planting list. Ask for our famous Christmas Tree Growers' Guide.

Many other Evergreens, Hardwood, Ornamental and Shade Trees

MUSSER FORESTS, INC. BOX 6-D INDIANA, PA.

Don't Gamble with the WEATHER

CURE YOUR HAY THE SAFE WAY



WITH A HARTZELL CROP DRIER

- eliminate the weather risk
- increase feed or sale value

Whatever type of hay-drying system you're planning, your nearby Hartzell representative will be happy to help you work out the details. And, Hartzell has the equipment to do your job . . . oil-fired portable driers (shown above), gas-fired units, or fans for natural air drying.

HARTZELL PROPELLER FAN COMPANY
Agricultural Division — Dept. F Piqua, Ohio

Please send me information on hay-drying systems.

Please send information on ☐ oil-fired driers ☐ gas-fired driers ☐ hay drying fans

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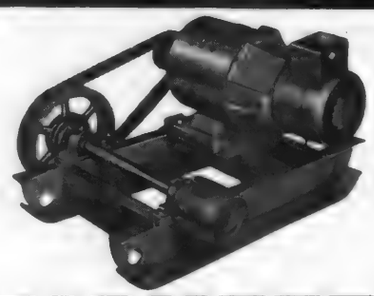
CITY_____ STATE_____

Your Own Low-Cost ELECTRIC POWER



PIONEER GEN-E-MOTOR

GENERATORS and ELECTRIC PLANTS

Don't risk power line failures. Enjoy the many benefits economical Pioneer Generators bring to your farm. Complete gasoline engine portable power plants as well as tractor driven models bring you *electric power when you want it, where you want it.*

PIONEER GEN-E-MOTOR CORP.
5834-A West Dickens Avenue,
Chicago 39, Illinois

Get our free catalog. Over 40 models from 500 watts to 12KW units designed for farm use.

Name .....

Address .....

Town .....

OVER THE BACK FENCE

(*Continued from page* 37)

"Their mistaken argument has run like this: The top limit for average prices is 54s 7d per sc deadweight, which is equal to 39s 9d sc liveweight, and the bottom limit is 44s 7d, which is equal to 32s 7d. The guarantee payment in the first four-week period was 8s 5d, so that if market prices averaged above 31s 4d, the guarantee payment would be reduced by a stabilizing adjustment to limit the total average return to 39s 9d. Similarly, at the present time (end of April), with the guarantee payment of 7s 7d, and market prices tumbling, farmers have in mind an average market price of 25s (32s 7d minus 7s 7d) as the bottom limit. Both calulations are fallacious!

"In other words, auction market prices will have the average below 21s per sc livestock before a stabilizing adjustment operates at the bottom of the scale while the guarantee payment is 7s 7d, and they had to average about 34s per sc liveweight before it operated when market prices were high in the first half of April."

THE FARM'S PICTURES

Cover by Joe Munroe

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Portable, versatile . . . complete it can be used throughout the year—handling wilted hay for mow drying, corn or grass silage for filling upright, trench or bunker silos, blowing grain or stacking. Wagon Unloader and Unloading Rake makes the entire job of forage handling completely automatic.

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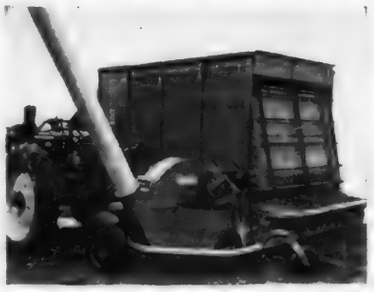
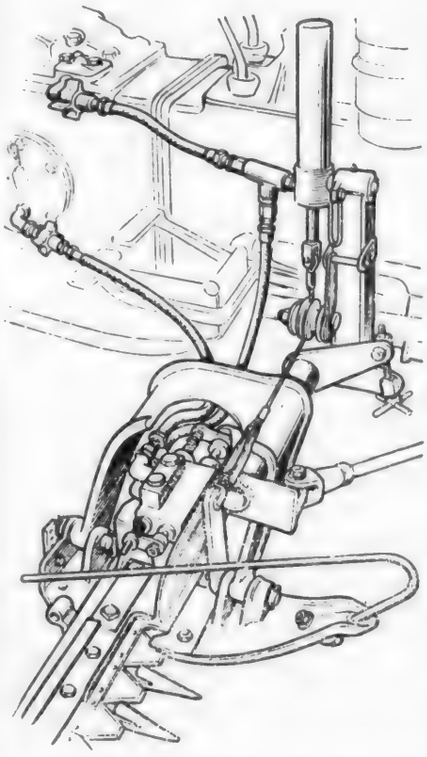


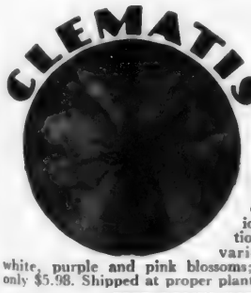
KOOLS BROTHERS, INC., APPLETON, WISCONSIN

Look! No Pitman We've wondered for a long time why the mower people haven't used hydraulic power to eliminate the pitman and all of its troublesome parts. In fact, the last time we wondered about this was in our story, "All About Hydraulics" (Winter 1957). Now in the English magazine "Farm Mechanization" for January, 1957, there are pictures and drawings of a new hydraulic mower made by the Stanhay Company. A drawing of this mower mounted on a Ferguson tractor is shown below.



There is no pitman and the mower can therefore work at any angle from 20° below horizontal to the vertical position. Oil pressure is taken from the jack tapping of the tractor pump to a reciprocating hydraulic unit attached to the head of the cutterbar.

Pressure is directed to alternate sides of a piston in the unit by an automatic valve gear. The speed of the knife can be varied in relation to the forward speed of the tractor by selecting the correct engine



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revolutions and suitable forward gear. The relief valve on the tractor pump protects against overloading.

More SS Tips For Farmers **Are you self-employed?** Compute your farm income on the Schedule F attached to your Federal income tax return and show your Social Security number. You pay 3% on the first $4200.00 of your income *even though you aren't required to pay income tax.* The rate increases to 3⅜% on 1957 income because of new disability benefits to which you may become entitled.

Are you an employer? You file a separate report on Form 943 for your employees. Get your forms and instructions from Internal Revenue Service. For 1956, you paid 4% on the first $4200.00 cash wages paid to each worker in the year—and half of the tax could have been withheld from the employee's pay. These amounts become 2¼% *each* in 1957.

DAIRY BARN

(*Continued from page* 18)

of corn or a hundred pounds of milk. But fortunately, there are some persevering souls who have dedicated themselves to getting the answers to these problems. Not only does the cost situation change rapidly, but it takes a long time to collect and publish all the facts and figures that go into one of these studies. That's why the figures we have here are probably out of date by now, having been collected well over a year ago. But they are about the latest and certainly the most accurate we can find and they help to give the dairyman at least some orientation, cost-wise. They were compiled by the Agricultural

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Economics Department of Cornell University from a study of 113 dairy farms in western New York State.

The average size of the milking herd on these farms was 23 cows, says the report, and they produced 7900 pounds of milk per cow. Total capital investment was $40,000 per farm. Feed cost ran right around $200 per cow, $2.45 per hundred pounds of milk.

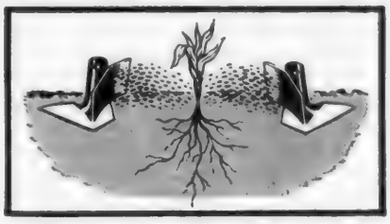
Labor requirements averaged a misleading 131 hours per cow, and we say misleading, because the actual labor requirements varied so widely from farm to farm as to make the average a rather unreliable figure. Nevertheless, the researchers valued this labor at an average of 78 cents per hour, another sorry-looking figure, what with the minimum wage now set at $1 per hour by Federal standards, or around $100 per cow.

Building use, depreciation on cows and milk hauling totaled $16; interest on investment in cows, bedding and charges for equipment use came to $10 per cow.

When they were all totaled up the net costs, after allowing credits for manure and calves, came to $388 per cow, $4.59 per hundred pounds of milk. On some of the farms this was shaded as low as $4 per hundred, at the other extreme it ran to over $6.

Admittedly, these figures are far from air-tight but they do show one thing, that even with a ridiculously low price for labor the average farmer in western New York was losing money a year ago on $4.50 milk. There is no indication the situation has improved on the cost side since.

NEW LANTZ SWEEPS COVER WEEDS *IN THE ROW*



Eliminate root pruning and throw dirt where you want it

Ideal for both first and last cultivation. Patented sweep deflector on Lantz Row Sweeps throws dirt farther in a more uniform flow—even covers weeds and grass between hills in the rows. Faster cultivating speeds are possible because sweeps can be set farther from row—preventing root pruning. Fit all leading tractor cultivators. Adjust dirt control with simple twist of shank. Proven effective shallow cultivation for corn, soybeans and other row crops. Extra yield from one acre will more than pay for your Lantz Row Sweeps.

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Please send me special field report folder and other illustrated literature on the sensational new Lantz Row Sweeps.
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My favorite Farm Implement Dealer is.....
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More news on cutters from *Servis*

New

E-60. Finding its Gyro cutters sturdier than necessary for many jobs, Servis introduces this 60" gear-driven clipper. Light weight, yet guaranteed to cut tough, 1½" brush. Pull and lift models. Sells for considerably less than the heavy Gyro models.

New

SC-80. Introduced to some territories late in '56, this new belt driven, twin-bladed, rotary mower cuts 1" brush — on an 80" swath. May be offset up to 32" outside rear tractor wheel. Very economical to operate.

New improvements in famous Gyro line:

Famous Gyro cutters, which shred brush up to 3" thick, now offer fan-type suction blades to lift stalks off ground. Also available, new ribbed rear skirt to raise stalks back up into path of blades. Re-positioned stationary blade and a front guide plate are other improvements that give superior shredding.

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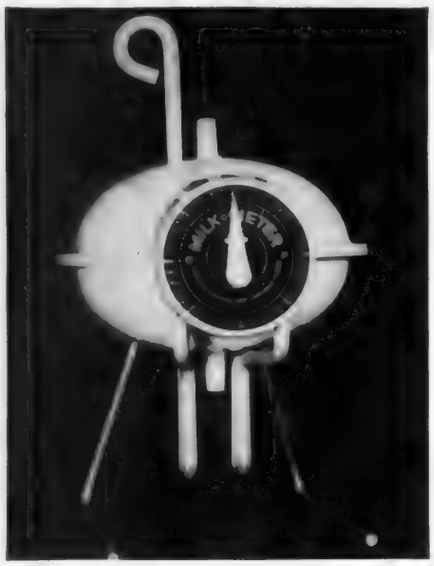
Milk Meter One of the minor disadvantages of the pipeline milker has been the difficulty it places in the way of cow testing. That little trouble spot now seems to have been removed with the development by a Florida firm of a device called the Milk-o-Meter. This piece of equipment, which looks like a sphere with



a dial hung on it, actually weighs the milk as it flows from the milker to the pipe line. It reads directly in pounds and quarter pounds and is available with a sampler for the extraction of a true proportionate sample of the milk for butterfat testing.

In using the Milk-o-Meter there is no need to expose the milk to airborn bacteria, flies or the extra utensils necessary with the open batch type scale weighers. It can be used with any make of hose-coupled milking machine, pipeline, pot-type or cow-to-can.

While the manufacturer guarantees 96 per cent accurary for the device, tests at various experiment stations have shown its level of accuracy to be 98.3 per cent.

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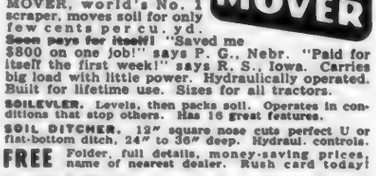

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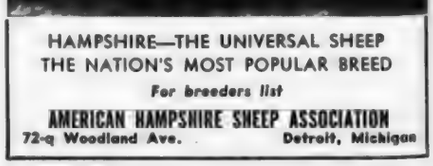

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LETTERS

(*Continued from page* 14)

Could You?

Sirs:

We often hear of refugees, who have nothing but a desire for freedom and peace, being backed by individuals or by groups so that they may get started in the business of farming.

My husband and I have much in common with these people in desiring a place to farm in peace. We, too, have very little. We want our children (three now, a fourth expected) to avoid many of the superficial things in which all of us get caught up in city living.

We feel that children need much room in which to explore and grow and learn. They cannot have it on a small city lot with a smaller back yard which they must share with flower borders, clothes lines, garbage cans, and trash burners.

My husband who is now 28 spent his summer when a teenager on a relative's cattle ranch. He also took some courses in agriculture when he was in college. I spent most of my childhood on a farm—also most of the teen-age years.

We both feel that we could be successful at farming or cattle raising if we could only get started. However, we have nothing to use as security, therefore we can get no backing.

We have wondered if you have encountered anyone who would back someone who is just another American wanting a chance. We are not asking for anything. I can teach to help my husband if necessary. I hold a lifetime credential for the State of California.

Anyone who would like to try to help these people is asked to write to the Editor, The Farm Quarterly, 22 East 12th Street, Cincinnati 10, Ohio.

(*Continued on page* 158)

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Normal—or even better than normal rainfall is often not sufficient. Protect your seed and fertilizer investment with a CMC RAINMASTER. These pumpers give you rain WHEN you want it — WHERE you want it — in AMOUNTS you want. Write for details.

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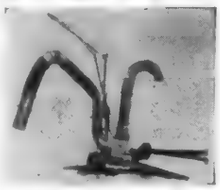

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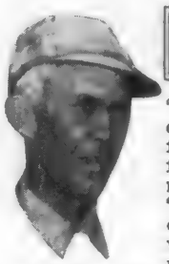

Harold Rold, Harlan, Iowa

"It packs and seals better, and does not dry out," says Harold Rold, Harlan, Iowa, farmer-feeder of his Lundell cut silage. In '57, he will feed 2000 tons of Lundell-chopped alfalfa and mixed grasses to put cheap gains on 300 cattle. "I make full use of my Lundell chopper to produce good silage. The cattle like it and it handles well," he states. Rold recommends a Lundell machine as good drought insurance. "With it you can harvest any type grass crop, including weeds," he declares, "and I've done it."

AG. COLLEGES

Iowa Agricultural Station researchers recently tested flail type harvesters, including Lundell choppers. Here is a summary of their report on Lundell-type lacerated material:

- *"It is commonly accepted that fermentation develops on the surface of stored plant materials. The juices flow from the severed ends of the plant stems. With square-cut materials, only the ends of the stems bleed. The flow is more generous from shredded and lacerated materials. This permits fermentation to begin sooner. And, prompt fermentation limits the development of undesirable molds and bacteria.*
- *"In studies of forage crop treatment for silage it was observed that shredded crops seemed to pack more easily into miniature silos. In their opinion, there was also obvious visual difference between the shredded and chopped materials.*
- *"In laboratory studies, shredded silage was found to have a lower pH than chopped silage, and low pH is very desirable. Less seepage also occurred from shredded than from chopped silage under laboratory conditions."*

Add These Lundell Benefits to Your Farm! Three Low-Priced Models to Choose From!

LUNDELL
OFFSET CHOPPER

- Adaptable to Grass Crops or Row Crops
- Only ONE Main Moving Part.
- Fully Offset; Can't Trample Crops.
- Optional Corn Head Attachment Chops Corn, Sorgo, Maize

Write TODAY for FREE literature, dealer's name:

LUNDELL MANUFACTURING CO.

Dept. F-3 Cherokee, Iowa

LETTERS

(*Continued from page* 157)

Humane Slaughter

Sirs:

I am enclosing a pamphlet describing the uncivilized methods used in most slaughter houses in this country. Also you may obtain a movie actually taken inside slaughter houses, simply by writing to the National Humane Society. If this is not gruesome enough for you, why not take a tour through several packing plants; that way you can enjoy the sound effects as well.

I was raised on a farm and help my sister out on her farm today and I see no reason why our animals must be tortured to death when there are methods which are much more humane, much easier, and more profitable in the long run. This has been proved by a few packing houses, whose names are in the pamphlet. These companies have profited by using humane methods because members of humane societies all over the country use their meat exclusively. They also say that because the animals are easier to handle when rendered unconscious, they need not employ nearly as many men, such as "knockers," etc.

The National Humane Society started the ball rolling on this measure, but has been supported by every humane society in the country. Congress received more mail asking for this legislation than any other they have ever had. You will be happy to know that the bill never came out of committee because of one member, who evidently was bribed. So you see laws are not made for the majority of the people. When will we become civilized? Any additional information on this and other subjects may be had by writing the National Humane Society, 733 Fifteenth St., N. W., Washington 5, D. C.

Mrs. Frank August

South Bend, Indiana

FARM BOOKS

(*Continued from page* 22)

value to a farmer in the sense that it might help him produce an extra bushel of corn to the acre. Its value will be greater than that—it will help him enjoy farming more.

The word *fathers* in the title can be taken in two ways for the book deals with the biological ancestors of corn, *teosinte* and the primitive corns, as well as the men, the philosophers, scientists, and dirt farmers, whose discoveries and intuitive selections developed our modern corn.

Those who think of the senior author solely as a political figure and high-level administrator, may be surprised at the humility and warmth of the figure who shows through this writing.

Soil Conservation, *by J. H. Stallings. Pentice-Hall, Edgewood Cliffs, N. J. $8.50.*

For the first 82 pages of this 575-page book the reader is treated to the standard lecture on the history and horrors of soil erosion. It is better done than most, but it still has the "ain't it awful" approach. From this introduction on, the book settles down to one of the meatiest presentations on how to prevent soil erosion that we have had the pleasure of reading.

The book is written for the farmer, no matter what part of the country he lives in, whether he is fighting wind erosion in Oklahoma or surface gullying in Oregon. It is well illustrated with both photographs and fact-packed charts and graphs.

The Wild Jackasses, *by Dale Kramer. Hastings House, New York, $4.50.*

In the summer of 1892, the seven thousand delegates and whooping, roaring friends of the Peoples Party—the Populists—met in the Coliseum ot Omaha, Nebraska, to rail against the bloated plutocrats of entrenched capitalism, the railroad magnates, bankers, middle-men, grain gamblers, packing house tycoons, and other assorted enemies of the hard working farmer. They also passed a platform that was thought, by their city brethren, to be the lunatic outpourings of hysterical plowmen. Some of the more radical demands contained in this document were: a graduated income tax; postal savings banks; the eight-hour work day; direct election of United States Senators; a free, secret ballot; abandonment of the gold standard; and liberal pensions for Civil War veterans. The story of the background of the agrarian movement, the Anti-Monopolists, Greenbackers, that led to this convention and continued for the first two decades of the next century cannot be told without telling of the colorful

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Waldron, Michigan

"We burned out in August and had our new Rilco barn ready for use by October. That's fast construction!" says Bob Laser. The Laser brothers, who keep 40 purebred registered Holstein and 5 bulls, have planned an efficient arrangement of floor space for their new Type 72 straight side wall Rilco barn. Rilco post-free interiors are easily arranged to suit individual requirements . . . easily adapted to changing needs.

For fast, economical construction, Rilco rafters are factory shaped, cut to length, drilled for connectors, delivered with hardware. Each rafter is made of selected kiln-dried West Coast Douglas Fir, permanently bonded with waterproof glue.

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West Unity, Ohio

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men who were behind the movement. Dale Kramer does an interesting job of painting the portraits of such men and women as Ignatius Donnelly, Mary Ellen Lease, and Sockless Jerry Simpson, but his best sketch is that of the man who started as a boy orator with the Populists and Grangers and ended as the voice of agriculture discontent in the 1930's — Milo Reno.

To those who tend to view with alarm and to those who view the viewers with alarm with alarm it is worth noting that the passing of most of the Populist legislative demands has neither brought about a paradise on earth nor has it shattered our way of life.

New Films

Vo-ag classes and local farm organizations are finding that their motion picture projector is one of the best discussion leaders they have. Here are a couple of late films:

Green Leaves and Green Backs. *30 minutes. Color. Distributed without charge by Aerovent distributors or write Aerovent Company, P.O. Box 28, Lansing, Michigan.*

The problems and processes of hay drying from the conversion of a hay loft for drying and the time of operation to the feeding and nutrition of the dried hay and the cold economics of the process are covered in this 16-milimeter film.

C.I.P. *45 minutes. Color. Distributed without charge by Surge dealers or write Babson Bros. Co. 2843 W. 19th St., Chicago 23, Illinois*

With the change to pipeline milkers, dairymen are asking, "How do you keep the pipe clean?" C.I.P. means Cleaned In Place and this movie shows exactly how one manufacturer recommends it be done.

FARM BOOKS RECOMMENDED BY THE EDITORS

Livestock & Crops

Feeds and Feeding (22nd ed.)—by F. B. Morrison **$9.50**
New edition of complete book on livestock and poultry feeding. Reviewed this issue.

Beef Cattle—by Roscoe R. Snapp **$6.50**
A carefully revised edition of this excellent book on beef production.

The Livestock Book—by W. R. Thompson et al. **$3.50**
This is the sequel to the best selling "Pasture Book." It's a good one.

A Veterinary Handbook for Cattlemen—by J. W. Bailey **$3.95**
For that emergency when you can't reach the veterinarian.

A Veterinary Handbook for Swinemen—by J. W. Bailey **$3.95**
A companion volume for the hog raiser.

Forage Crops (2nd ed.)—by Gilbert H. Ahlgren **$7.00**
A new second edition, giving emphasis to the mechanization of grassland farming, the use of fertilizers, etc. Reviewed in this issue.

Dairy Science (2nd ed.)—by W. E. Petersen **$6.50**
A new edition of one of the best books on dairying.

Swine Production (2nd ed.)—by W. E. Carroll & J. L. Krider **$6.50**
Do's and don't's for all hog raisers.

The ABC and XYZ of Bee Culture—A. I. Root **$4.25**
In dictionary form. Includes latest practices.

Cotton (5th ed.)—by Floyd Barnhart **$3.75**
A practical book for the southern farmer.

Sprinkler Irrigation—by A. W. McCulloch and J. F. Schrunk **$6.50**
How to operate and maintain sprinkler systems.

Soils and Fertilizers—by Firman E. Bear **$6.00**
An understandable book on the complex subject of fertility.

Grasses & Grassland Farming—by H. W. Staten **$5.00**
Covers grasses in all parts of U. S.

The Pasture Book—by W. R. Thompson **$3.50**
Revised edition of this information-packed book.

Colorstrip Plant Testkit **$4.00**
Tells whether your plants are getting enough nitrogen, potassium and phosphorus. Complete instructions come with the kit.

Farm Management

A Practical Guide for the Beginning Farmer—by Herbert Jacobs **$3.50**
A book to give you an intelligent start in farming.

The Farmer's Handbook—by John M. White **$4.95**
Easy reference book on crops, livestock, and farm problems.

Handbook of Agricultural Chemicals—by L. W. Hanna **$3.25**
The chemicals, directions for use, and precautions in using.

Farming for Profit—by H. R. Herndon **$3.75**
A primer for those starting in agriculture.

The Ford Almanac **$1.00**
A new, interesting, amusing edition of this favorite.

Law and the Farmer—by J. H. Beuscher **$4.95**
New 2nd edition. Includes changes in farmer's income tax and social security benefits.

The Farm and Ranch Record Book **$4.50**
Loose-leaf farm record-keeping book. Ideal for income tax purposes. Refill sheets available.

Miscellaneous

The Singing Wilderness—by Sigurd F. Olson **$4.00**
"The Forest Pool" on page 68 is a chapter from this new book.

Corn and Its Early Fathers—by Henry A. Wallace and William L. Brown **$3.75**
Not a book on how to get more bushels to the acre, but an interesting history of the development of this important crop.

The Wild Jackasses—by Dale Kramer **$4.50**
The Populist Party of the 1890's and their "radical" platform, much of which is actual legislation today. Reviewed this issue.

Soil Conservation—by J. H. Stallings **$8.50**
How to prevent soil erosion — all types — throughout the U. S. Reviewed in this issue.

Tornadoes—by Snowden D. Flora **$3.50**
The twisters and how to avoid being killed by them.

From My Experience—by Louis Bromfield **$4.00**
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Raising Livestock—2nd ed. Pub. at $6.50 ..... Our price, $3.25
Soil Conservation. Pub. at $3.75 ..... Our price, $2.00
Soils and Fertilizers. Pub. at $6.00 ..... Our price, $3.00
Vegetable and Flower Seed Production. Pub. at $8.50 ..... Our price, $4.25

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MR. LAWRENCE BEGG
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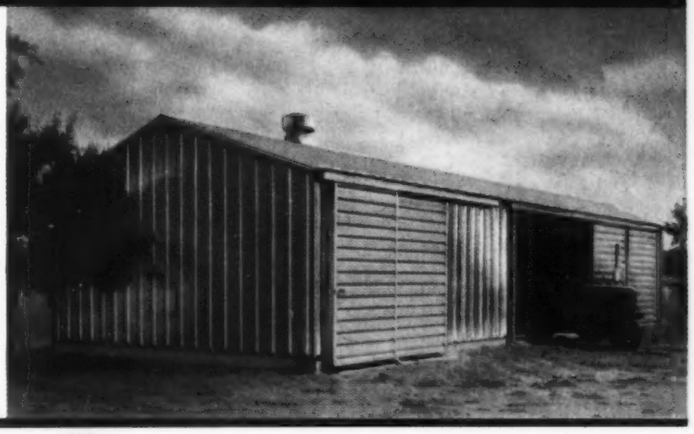

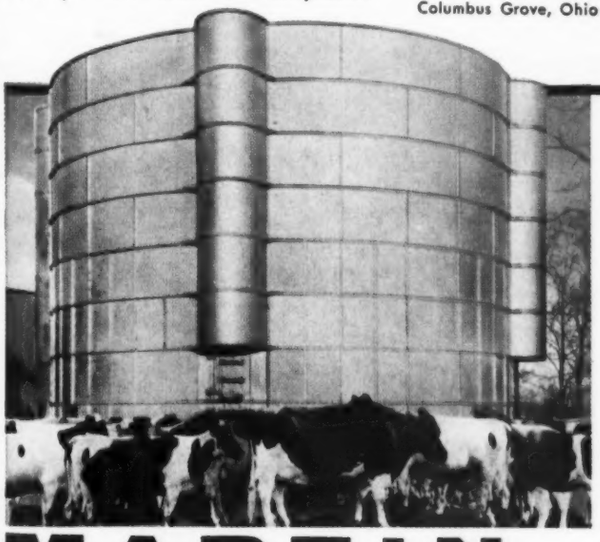

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